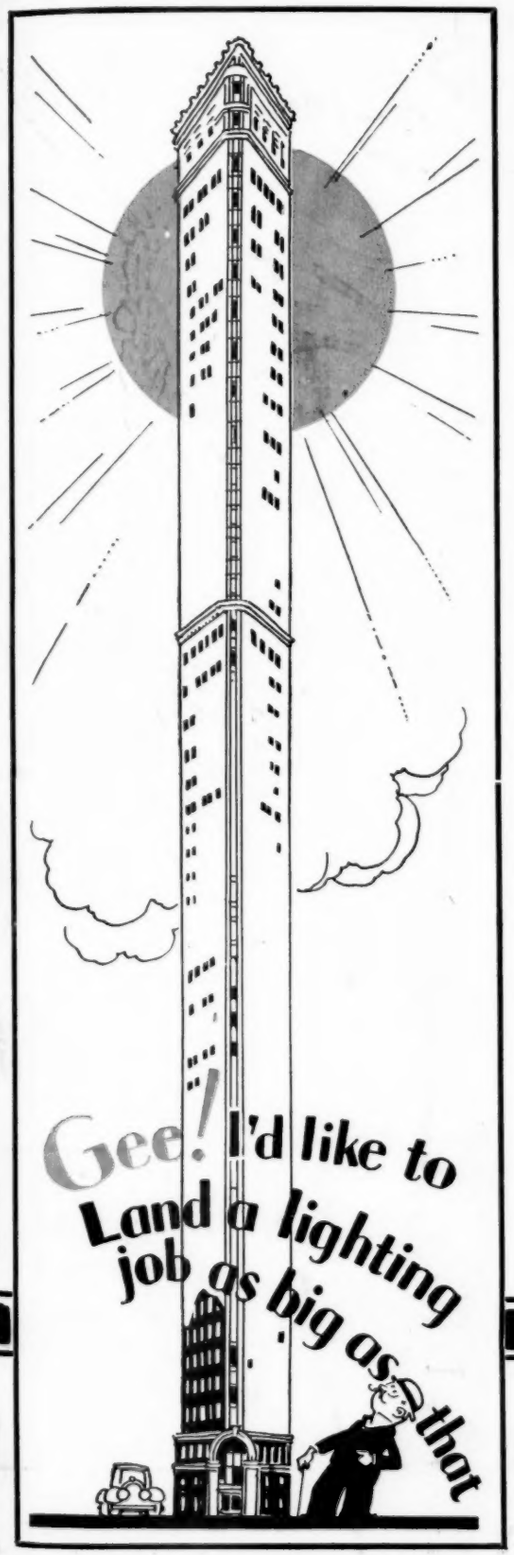
The Electragist

TRADE MARK REG. U.S. PAT. OFFICE

Vol. 27, No. 3 — Association of Electragists INTERNATIONAL — JANUARY, 1928

ST. LOUIS PUBLIC LIBRARY
App. Science Dept.



In the Meantime

WHILE Mr. G. I. Wisht wastes his time yearning for skyscraper profits, Mr. Ike N. Gettum hops around the corner and sells "Red Spots" to the neighborhood haberdasher.

In the aggregate, these weekly 12 and 24-unit orders mean a very comforting net profit to *any* lighting contractor.

"Red Spots" are easy to sell. Those who don't believe so never really tried.

Let us

Each "Red Spot" saves an average of ten minutes of your workman's time installing. Add that to your profit. "Red Spots" are designed to save labor.

show you how

Contractors have made millions of dollars in gross and net profits selling "Red Spots" during the last ten years. They'll make more in 1928.

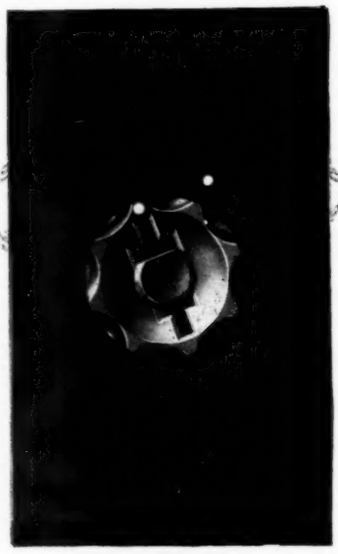
The F. W. Wakefield Brass Co.

Vermilion, Ohio, U. S. A.

— to desire the best in plate harmony
— glance in the branch of the ACORN TREE.

"It's A Great Plate"

— Ask Anyone



ACORN SWITCH-TAP
A Combination Switch And Outlet

Another Distinctive Hubbell Feature

A Switch and Outlet, two in one. Small enough to fit any standard outlet box.

A convenience that affords PERFECT Insulation, banishes the fear most women have of shock or short circuit due to wet hands. Recommended for kitchen, bathroom and laundry

The Cover-Plate can be finished in baked enamels; pastel; wood grains, marble; to meet appointment requirements and blend with decorative scheme.

Control the lights without disturbing the outlet.

Learn more about the ACORN Family Fill in the Blank TODAY!

ACORN LINE
"WATCH THE ACORN GROW"
HARVEY HUBBELL INC.
BRIDGEPORT CONN. U.S.A.

Write Your Nearest Branch Office

Atlanta, Georgia
138 Marietta St.
H. C. Biglin

Boston, Mass.
176 Federal St.

Chicago, Illinois
318 W. Washington St.

Denver, Colo.
1109 Broadway
The Sales Service Co.

New York City, N. Y.
30 E. 42nd St.

Philadelphia, Pa.
5th Avenue
Philadelphia Bourse
(Exhibition Dept.)

Pittsburgh, Pa.
State Theater Bldg.

San Francisco, Cal.
390 Fourth St.
Garnett Young & Co.

Send me complete information
on the ACORN LINE

Name.....

Street.....

City.....

State.....

E. 5-1-28

For Permanency And Beauty — Use
ACORN SCREWLESS PLATES

THE ELECTRAGIST, January, 1928, Vol. 27, No. 3, $2.00 per year, 20 cents a copy. Published monthly at 100 Liberty Street, Utica, N. Y. Association of Electragists—International, 15 West 37th St., New York, N. Y. Entered as second class matter September 1, 1919, at the Post Office at Utica, N. Y., under the act of March 3, 1879.

The Electragist

(The National Electrical Contractor and The Electrical Contractor-Dealer)

Official Journal of the
Association of Electragists—International

Vol. 27 JANUARY, 1928 No. 3

The Enemy Within the Gates

By S. B. WILLIAMS,
Editor, The Electragist

INDUSTRIES are like families. Some grow up together and some grow up apart. There is a family of boys I know who have grown up together. They are all different, have different likes and dislikes; have different dispositions, but they have always pulled together. If there was a job to be done, they all pitched in and finished it. They work hard but they always have time for play. Some have made money and some not, but they look to each other for advice, inspiration, encouragement and help when needed.

And then there is another family of boys who are just the opposite. They apparently have no community of interest. They work alone and when they are in trouble they have to rely on acquaintances for help, advice or encouragement or else, as is generally the case, work it out alone.

The electrical industry is something like the latter family. Its four boys, the power company, the manufacturer, the jobber, the contractor, have drifted apart. The family ties no longer bind.

And yet a few years ago one would have said that the electrical industry was more like the first family. It's strange. The industry did grow up together when the boys were young.

In those days all were poor. The four boys were struggling to keep their heads above water and they had to rely on each other. Besides there was an enemy without—gas. It took the combined strength of the four to defeat him.

Of late years, however, conditions have changed. The boys have drifted apart. Some in fact are quarreling. What is the trouble? What is this enemy within the gates?

Some think that the trouble is due to the fact that one of the boys, who has a monopoly, has grown rich and powerful and like so many new rich, it has gone to his head. Undoubtedly, this has something to do with the strained relations and yet one can't help remembering that the poorest of the boys is frequently very unprogressive and sometimes tears down where others have built.

But this is not the real underlying trouble. The real trouble is that the boys never really appreciated the benefits of working together. When they were united as a family the struggle to get ahead was so great that it became an obsession and now they continue the struggle, but without each other's help and inspiration.

There is an old fashioned Anglo-Saxon word for this—it is Selfishness. This is the enemy within the gates. This is the enemy which is preventing the electrical industry from growing as it should grow.

The four branches of the electrical industry must recognize their interdependence. Only by their collective strength will the industry prosper.

The first tangible expression of industry interdependence is the reorganized Society for Electrical Development. The thoughtful men of the industry are looking to it to bring us all together—to utilize our collective strength.

But before that collective strength can rise to its full force there are certain economic characteristics or traits amongst the four participants that must be studied and remedial measures offered.

(1) The central stations must give working expression to a trade relations policy in the same fine way they have with their public relations policy.

(2) The manufacturers with distribution must not deny distribution to others through existing channels, thereby creating distributing methods that prevent profitable expansion of the industry.

(3) The jobber must not use his position as a wholesaler to promote his own personal end at the expense of others.

(4) The contractor and dealer must produce in the measure expected of them and become constructive forces.

Let us take each in turn and detail the problem involved, for perhaps if the problem is more clearly seen its solution may the more readily be discovered.

Central Station

1—Central Station Trade Relations Policy: Everyone, manufacturer, jobber, contractor and dealer, work for the central station—without compensation. Every thing they sell, almost without exception, ultimately results in more revenue for the central station. There is no sales expense to be borne by the power company for the sales made by others.

It would seem, therefore, that the prosperity of these others would be en-

couraged by the central station and that the central station would do nothing in any way, shape or manner, to discourage or hinder these free sales efforts But what do we find?

(A) Merchandising policies that make it impossible for others to compete at a profit except with inferior, sub-standard goods.

1—Down payments and terms out of line with generally conceded good business practice.

2—Use of light bills to collect accounts.

3—Use of general overhead to carry merchandising loss.

4—Cut prices on such standard lines as incandescent lamps when others are required by agency regulations to sell at established retail price.

5—Methods of compensation of salesmen on subsidy basis thereby at times producing questionable selling practices.

6—Use of premiums.

7—High turn-in allowances on used equipment.

(B) The all too frequent habit of refusing to play ball unless played according to their rules. (Attempt to break down National Electrical Code.)

(C) Purchasing Methods. Syndicated purchasing direct at jobber prices or lower has taken considerable business away from the jobber without bringing any material benefit to the utility. To accommodate these shipments the utility must duplicate the jobber's storage space but at a greater cost and with less efficiency.

(D) The carrying on of enterprises which are not a part of a power company's business as a monopoly:

(1) Wiring contracting
(2) Jobbing
(3) Fixture Selling
(4) Radio Selling
(5) Selling of non power consuming merchandise such as
  (a) Flashlamps
  (b) Silverware

Manufacturers

2—Manufacturers' Distribution Policies: There are probably not more than six or seven hundred legitimate electrical supply jobbers but there are probably nearer two thousand concerns that are receiving recognition as jobbers by one or more manufacturers. Manufacturers who enjoy legitimate distribution cannot expect to deny this same outlet to others and have anything but chaos.

When regular avenues of trade are shut to reliable manufacturers they will not sit idly by and accept the situation but will create for themselves an avenue which nine times out ten will result in less business for the regular jobbers and a demoralized market.

Recently a reliable manufacturer of conduit asked for a definite number of cars of pipe from a certain trade area. Being refused he has gone out to sell four times as much conduit in that area direct to the contractors. This means a loss to the other manufacturers, to the jobbers and to the competing contractors. It produces a trade situation which is unfair to everybody.

If manufacturers cannot secure an outlet through existing recognized channels they will either sell direct or they will set up new distributors or jobbers.

For the manufacturer to sell direct to the contractor or dealer is not good business for in order to be able to sell direct, in competition with jobbers and economically, the manufacturer must sell in large quantities, at jobbers' cost, to a few contractors or retailers. These in turn, in order to dispose of the merchandise quickly, must pass a price concession on to the public or someone else, thereby greatly disturbing the market for everybody.

If the manufacturer creates new jobbing outlets these outlets, in an effort to increase volume, in turn set up numerous new contractors and dealers. These new retail outlets do not create new business but compete with the established concerns on a price basis for existing work and trade. This is one of the greatest reasons why so many contractor-dealers are a liability rather than an asset to the industry.

Jobbers

3—Jobber Distribution Practices.

(a) Competition With his Customers: In his desire to increase volume the jobber has gone direct to the industrial plant regardless of size and sold supplies in competition with his customer, the contractor. When other methods failed he has encouraged the factory superintendent to create an electrical department and has helped place a man of his choice. This has taken both contracting and supplies sales from the contractor, without adding one bit to the total volume of electrical business and without proving more economical to the industrial plant. In fact it has been shown that industrial plant electrical departments cost more than having the work cared for by a good contractor.

(B) The jobber, too frequently, has no fixed price policy. He will quote a contractor's customer less than the contractor. He will quote different prices to different contractors. He will cut his price to get the order. This practice not only hurts the jobber, but it increases the uncertainty of estimating by contractors.

(C) Courtesy discount practice is another evil. Apparently, anybody can get a discount from most jobbers, especially if he has a card from the purchasing agent of an industrial plant. This practice does not create business but rather takes business away from regular dealers. The retort that retailers do likewise is no excuse, for in that case the retailer gives away his own profit, but when the jobber gives a courtesy discount he does not give his own profit away but some dealer's profit.

(D) Using jobbers' prices to engage, openly or on the side in the contracting business.

(E) Lack of a fixed credit policy, thereby permitting contractors to pyramid purchases. Such contractors are invariably the worst price cutters in competitive work. A better credit policy would build better contractors—contractors who would be better business men and salesmen.

Contractor-Dealers

4—Contractor and Dealer Must Become Constructive Forces.

A—Competitive Selling. Jobs are being bought at a price instead of being sold intelligently. The result more frequently than not is a smaller job which is not only unprofitable for the contractor but cuts down the market for the central station, jobber and manufacturer. The contractor cannot expect to be permitted to control the market of the three other branches of the industry unless his selling efforts measure up to what is expected of him.

B—Skinning the Job. The practice of cutting down on capacities after getting the job at a "below cost" figure, aside from the question of ethics, is unfair to the others because it limits their market.

C—Un-selling Jobs. There is no meaner practice than that of unselling a customer whom someone else has sold a real good job. This is the most destructive practice known.

D—Purchasing Methods:

(1) Scattering of purchases. Unless the contractor and dealer concentrates his purchases with one or two jobbers

(Continued on page 35)

Advertising the Motor Shop--I

Directories	Magazines	Athletic Teams
Newspaper Display	Circulars	Novelties
Newspaper Classified	Booklets	Exhibitions
Sales Letters	Hand Bills	Stickers
House Organs	Radio Station	Postcards
Programs	Name Plates	Shipping Tags

By HARR F. RANNEY

THE motor shop can be advertised with profit—but care must be used in spending the money. That's what 60 owners of motor repair shops, large and small, in all sections of the United States and Canada say. It's easy to pour money into a foolish publicity scheme, without any return at all, and once you start you may get into the position of one man who said: "I can't check the results to see if my advertising is doing any good, but I'm afraid to stop." But the experience of these sixty successful motor shops indicates that more sales and more customers can be obtained by making use of the right methods of going after the business.

Advertising in telephone directories and newspapers and by means of sales letters are the most popular and generally considered the best business-bringing methods of advertising the motor shop. Three of the sixty representative motor men, operating on a fairly large scale, issue house organs which are mailed regularly to old and prospective customers. Advertising in programs and magazines is almost unanimously considered practically worthless for the motor shop, while the mailing of printed circulars is considered the best possible way of wasting as much money as you can without results.

Directory advertising, either in the classified sections of telephone directories or in city directories, has the greatest following of any method of publicity. Eighty-five percent of the motor men say that a card or other small space in directories is useful in attracting new business. It is true, as a number of men pointed out, that this form of advertising often brings inquiries from buyers so small and with such poor credit that the business can not be handled with profit. But this difficulty is overcome by having an efficient credit department which looks up the record of every new customer and requires a deposit or cash in advance, if necessary, before the job is undertaken.

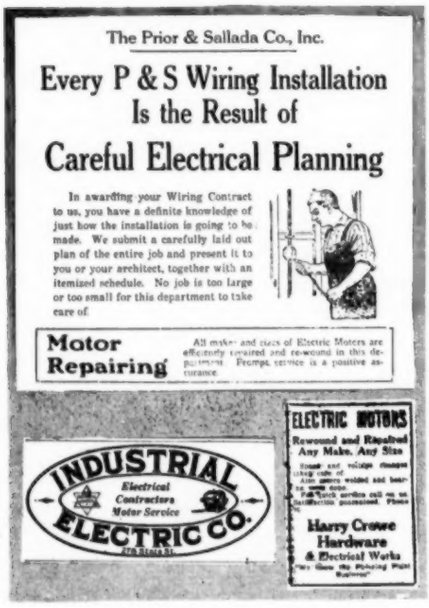
Sixty-six percent of the owners of motor shops use newspapers to advertise their business, most of them finding it advantageous to take space regularly, even if it has to be quite small. There is very little agreement on the amount of space to be used, because this depends a great deal on the type of shop. If a complete line of merchandise is handled, in addition to the motor business, the store may use larger space, featuring some special item, and giving the motor department a part of the space in each advertisement. If the shop handles motor business exclusively the most popular method is to use fairly small but regular space to keep the name of the shop, the address, and the telephone number easily accessible to old and prospective customers. About

Classified Telephone Directory

Many motor shops find this method of advertising profitable as people often consult a classified directory when they need a service such as motor repairing

30 percent use small classified space in newspapers; another 30 percent run advertisements of 4 to 6 column in., 28 percent run 10 or 12 in. advertisements, and 12 percent use 20 in. or more per insertion.

The favorite days for advertising


The Prior & Sallada Co., Inc.
Every P & S Wiring Installation Is the Result of
Careful Electrical Planning
In awarding your Wiring Contract to us, you have a definite knowledge of just how the installation is going to be made. We submit a carefully laid out plan of the entire job and present it to you or your architect, together with an itemized schedule. No job is too large or too small for this department to take care of.
Motor Repairing
All makes and sizes of Electric Motors are efficiently repaired and re-wound in this department. Prompt service is a positive assurance.
INDUSTRIAL ELECTRIC CO.
Electrical Contractors Motor Service
ELECTRIC MOTORS
Rewound and Rebuilt Any Make, Any Size
Harry Crowe Hardware & Electrical Works

Newspaper Advertising

Above is a sample of department-store-style advertising; lower left, a way to make a small sized advertisement prominent; lower right, typical small space newspaper advertising.

are Sunday and Tuesday. Friday and Wednesday are also popular, but Monday, Thursday and Saturday are not considered good days and, in general, are used only by those motor shops which run space every day of the week.

The Prior & Sallada Company of Williamsport, Pa., which has done an electrical merchandising and repairing business for over 30 years has taken a tip from the large city department stores and advertises all its departments all the time in large space in newspapers. G. Lester Betron, secretary of the concern, believes in consistency in newspaper advertising, saying: "Our aim is to keep the name of the concern linked with things electrical before the public." In one three-column advertisement in the Sunday papers about one-third of the space is devoted to "institutional" advertising which starts out: "Every P. & S. wiring installation is the result of careful electrical planning." The motor repair department gets a prominent share of the whole advertisement, and appliances featuring price are the specials designed to get people to read the advertisement and to come into the store to look around.

Large space advertising, entirely on motors, is only used occasionally, it was found, except when a motor shop takes larger space in a newspaper section featuring the new building in which the shop has installed the motors. One shop which does this is the Electric Power and Equipment Company of Columbus, Ohio, which runs a regular 4 in. space in each of three papers, but has a full page special upon the completion of some large building or operation. A. B. Weinfeld, an executive in this company, makes this comment on large space special advertising: "This sort of advertising does not pay and the only reason for doing it is to please an owner who usually runs a separate section in the paper on the completion of his building."

ELECTRIC MOTORS (85)

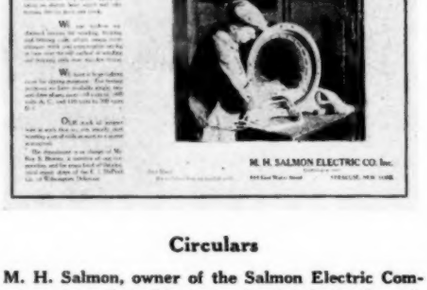
MOTORS, Bought, Sold, Exchanged, Repaired. Ver. 2882. Nights and holidays. Hwd. 5887-J. Electromechanical Co., Calvert & Franklin Streets.

STERNS, 66-70 Broadway, will loan you a motor while repairing yours; used motors bought, sold and exchanged. Phone Sen. 0196. Sterns Elec. Equipment Co.

Classified Newspaper Advertising

This method of advertising is considered good because it is inexpensive yet reaches people who are looking for a particular service.

Sales letters are used by 55 percent of the motor men in this survey to increase their motor business. Lots of motor shops use sales letters as much to retain old customers as to get new ones. The majority of those who send sales letters find it better to address the letter to a particular individual, if his name can be obtained, rather than to a company; quite a few firms send the same sales letter to several individuals in the same company, for example, to the purchasing agent, the general manager, the factory superintendent, etc., finding that the duplication is useful in getting results.



Circulars

M. H. Salmon, owner of the Salmon Electric Company, says that this type of printed circular advertising does not pay and has been abandoned.

Mailing lists for sales letters are obtained from a wide variety of sources. The most favored source of lists of prospective new customers is a directory, such as the classified telephone directory, city directory, or a credit rating directory such as those published by Dun or Bradstreet. The latter source is especially good because the prospects have good credit ratings and if they become customers they are more apt to pay their bills. A number of motor

Tags

Designed to be tacked up in industrial plants, or hung where they will catch attention, these tags help to get business for these motor shops.

shops (31 percent) go after additional business from old customers by enclosing a sales letter, circular, or booklet when they mail out their invoices. Some of these devote most of their time to keeping the old customers happy and active buyers, feeling that one steady-buying old customer is worth two or three unknown new customers.

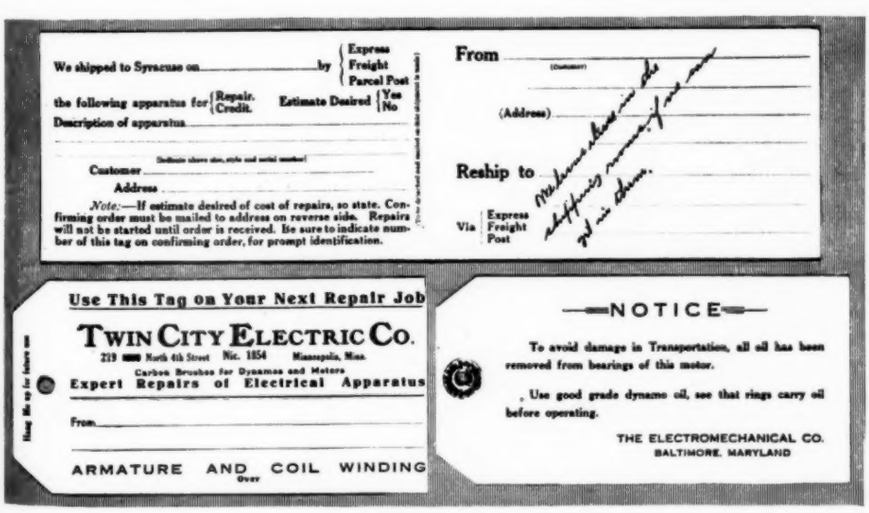
Some motor shops send pamphlets or circulars, describing new motors for sale, prepared by manufacturers and imprinted with the shop address with all outgoing mail; two shop owners get lists of industrial plants and other motor prospects from their central stations. One man said that all prospects called upon by salesmen are followed up by mail, keeping the prospect interested until the salesman has time to call again. One man has the unique idea of going to the county assessor and taking off the names of big taxpayers as he likes to handle only big jobs.

A successful seasonal plan of direct-mail promotion has been adopted by the Meier Electric and Machine Company, Indianapolis. "There are certain seasons of the year," the manager said, "when certain lines of business are in the market for electrical lines; for instance, September, we find, is a good month for the mines; October for grain elevators; November for retail hardware trade; December for individual sales from our retail department, etc. When the appropriate time arrives we plan our advertising and direct mail work accordingly. It has in most instances repaid us well." Letters are sent to the prospects in the line of business they are concentrating on for the month, and the results of each sales letter are checked by the number of inquiries and sales following the mailing.

INSTALLING MOTORS
ELECTRICAL INSTALLATION
for factories, plants, etc., is our business. Due to specialized training and careful attention to every detail, our work, once done, is right. There is no tearing down and going over any of our jobs. We have electrical engineers who are capable of correctly planning and equipping any size plant or factory. Get in touch with us for estimates. You incur no obligation.
S. J. O'BRIEN, Inc.
WE REPAIR, REWIND AND REBUILD
Motors, Generators & Controllers
We True Large Commutators Without Removing From Premises
AUTHORIZED DEALER
FOR GENERAL ELECTRICAL MOTORS AND GENERATORS
122 W. 124th ST. Phones, Morningside {1873 1874 NEW YORK CITY
How Are Your Electric Motors Running?
You know a bad spot on the commutator, or brushes flashing can cause the motor to burn up, if not attended to in time.
We have a complete shop for all repairs from rewinding down.
We send emergency men at your call, on ten minutes notice.
On large motors or generators we can true up your commutator with our own special equipment without shutting you down.
Our motto is SERVICE
Give us a trial.
S. J. O'BRIEN, Inc.
122 WEST 124th STREET
Is our New Building
Phones: Morningside 1873-1874

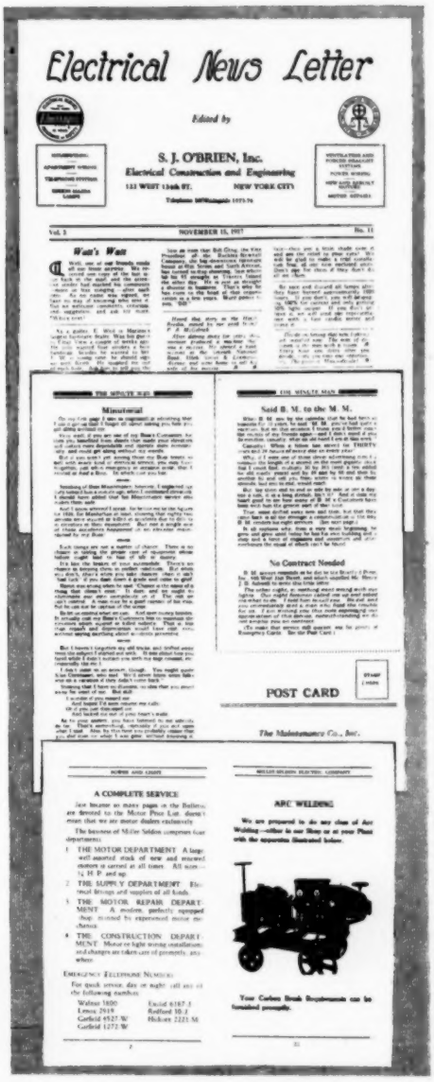
Postcards

S. J. O'Brien finds that a regular barrage of postcards, sent to the same list over and over again, is productive of business.


We shipped to Syracuse on ... by {Express Freight Parcel Post
the following apparatus for {Repair. Credit. Estimate Desired {Yes No
Description of apparatus
Customer
Address
Note:—If estimate desired of cost of repairs, so state. Confirming order must be mailed to address on reverse side. Repairs will not be started until order is received. Be sure to indicate number of this tag on confirming order, for prompt identification.
From
(Address)
Reship to
Via {Express Freight Post
Use This Tag on Your Next Repair Job
TWIN CITY ELECTRIC CO.
219 North 4th Street Nic. 1854 Minneapolis, Minn.
Carbon Brushes for Dynamos and Motors
Expert Repairs of Electrical Apparatus
From
ARMATURE AND COIL WINDING
Over
NOTICE
To avoid damage in Transportation, all oil has been removed from bearings of this motor.
Use good grade dynamo oil, see that rings carry oil before operating.
THE ELECTROMECHANICAL CO.
BALTIMORE, MARYLAND

Shipping Tags

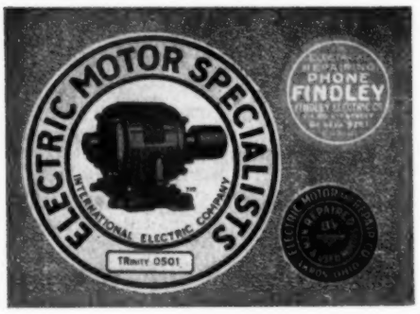
The combination postcard-tag above is described in this article; lower left, tags were placed in shipping rooms of industrials; lower right, shipping tag which seeks to create good will by giving information.



House Organs

Top, house organ of S. J. O'Brien, Inc.; center, "The Minute Man," house organ of The Maintenance Company lower, pages from the house organ of the Miller-Seldon Electric Company, described in this article.

The Meier company believes in the slogan idea in its letters, aiming to attract the reader's attention and induce him to read. The slogans, which are changed each week, are typed at the bottom of each outgoing letter. For example, the slogan for the week of December 1 was: "Business is Good; We Believe in Prosperity."



Stickers

Stickers can be usefully employed on letters, shipments, in shipping rooms, etc. Upper right, white letters on red background; lower right, red letters on black background.

About one-fourth of the motor men advertise in magazines, but only three or four of these were satisfied with the results they had. The magazine advertising is universally in a local trade paper reaching the type of prospects they wish to do business with. One who specializes in installing and repairing motors for rubber factories uses the rubber trade journals; the Miller-Seldon Company of Detroit uses six in. in the *Michigan Manufacturer* each month.

Program advertising is considered very unsatisfactory by most motor men who comment:

"We use the smallest amount of space possible in programs and then only when compelled to do so."

"We advertise in benefit programs—no more than we have to."

"The space we use in the local movie program is a case of 'you scratch my back and I'll scratch yours.'"

"All money spent on programs we think brings very little results."

The most modern method of advertising a motor shop is used by the Electric Shop of Saskatoon, Sask., which operates its own radio station—CFQC. As they sell time on this station to outsiders the station is on a paying basis and hence their own advertising costs them nothing at all. One of the repair men gives a talk over the radio on magnetos, motors, merchandise, or radio, and this brings in considerable business.

A great many motor shops place a name plate on motors which have been rebuilt, repaired, or installed, and this brings in some business with the advantage that it is very inexpensive. If the repaired motor performs good service the good-will resulting is very useful in getting a fine type of customer—one who comes recommended by an old customer.

Novel methods used by some motor men include basketball and bowling teams which compete in local leagues and get "name publicity" in the newspapers; giving electricians' knives with the shop's name on the blade to electricians in industrial plants; Christmas cards, calendars, and name painted on employees' spare tire covers.

Three motor shops have a house organ which is regularly mailed to prospects and old customers. The Maintenance Company of New York has a four page 9 in. by 4 in. folder called *The Minute Man*, written in a breezy, interesting, friendly way. Two pages are devoted to comments in a humorous vein and two pages contain direct selling talk written in the same style. On the third and fourth page is a postcard which may be torn out and mailed back to the company requesting further information. On the back page are listed the eight services which the Maintenance Company performs: "1. Maintenance of electric motor and elevator equipment at a fixed sum per year. 2. Repairing motors and other electrical apparatus, including all rewinding, reinsulating and refilling of commutators. 3. Elevator repairs, overhauling, recabling. 4. Light and power wiring planned and installed. 5. Electrical and mechanical engineering, testing. 6. Manufacturing, mechanical and electrical, single items or quantities. 7. Submetering current, testing motor, auditing bills. 8. Mazda lamp replacements.

(To be continued)

"When You and I Were Young, Maggie"
— this dynamo was installed at The Layton Co.
PUT IN SERVICE 1890 BY HERMAN ANDRAE AND JACK TELLIER
TAKEN OUT OF SERVICE 1926 BY GEORGE ANDRAE AND ART TELLIER
36 YEARS of Continuous Service
by the same machine the same men the same company
DROP IN TO SEE US AT
Herman Andrae Electrical Co.
2040 Clybourn Street
"SERVICE WITHOUT AN ALIBI"
AUSTIN & MOORE INSTALLATION
PROMPT ELECTRICAL REPAIR SERVICE
"Trouble Shooting"
Washing Machines
Vacuum Cleaners
Lighting Circuits
Annunciators
Bells
Motors
Compensators
Power Wiring
Breakdowns
Commutators
2040 CLYBOURN STREET
Herman Andrae Electrical Co., Inc.
GArfield 2139 — PHONES — GArfield 1762
Night Phone: Calumy 0769-M
ELECTRIC SERVICE CO.
W. F. GERSTNER, Manager
Rewinding and Repairing of
Dynamos and Motors
Industrial Power Wiring
New and Used Motors
Carbon Brushes and Fuses
120-122 North Second Street
ST. LOUIS

Blotters

The advantage of blotters, according to motor men who use them is that they are useful and hence are kept on the desk of the superintendent, telling their sales story all the time.

Grounding, particularly as applied to portable electrical equipment, is probably the most important technical problem now being considered by those interested in the wiring of buildings. In all probability, some solution of this problem will find its way into the 1928 National Electrical Code which will greatly influence American wiring practices, especially in industrial plants. Electrical contractors are urged to carefully read the two following articles on the subject. They express more simply and more clearly the problem and the probable solution than anything we have here-to-fore seen.—The Editor.

Protective Grounding*

By W. M. RUNYON
Crouse-Hinds Company, Syracuse, N. Y.

THERE are many kinds of ground circuits which are not safety circuits, but which are employed for entirely different purposes, such, for instance, as the power grounds used in generating and sub-stations for grounding the neutrals of transmission systems, lightning arrestor ground connections, railway return systems, earth return circuits for telephone, telegraph and other communication and signaling systems, railroad block signal systems, wireless equipment, etc.

By a safety circuit we mean a circuit which is installed for the sole purpose of reducing the shock hazard or the fire hazard, or both, which are incidental to the use of electricity. Such circuits are not intended to be used for carrying the working currents of the system and they function only when some abnormal condition arises, and usually for but very short periods.

The generation, transmission, distribution and utilization of electricity is accompanied, unfortunately, by a considerable hazard in the form of danger to human beings from electric shock, and this we term the "shock hazard." Even a very slight shock, while not in itself harmful, may at times result seriously by causing the workman to lose his balance while working in a dangerous position, or to cause a sudden and uncontrolled movement of some part of the body, which may result in bringing tools or parts of the body into contact with live parts of a circuit.

*Paper presented at meeting of Association of Iron & Steel Electrical Engineers, Reading, Pa., December 3, 1927.

Shock hazards fall quite naturally into two groups: High voltage and low voltage.

The high voltage hazard is the result of the possibility of the higher voltages of a transmission or distribution system being imposed upon the low voltage wiring systems, due to the breaking down of a transformer, the crossing of high and low tension wires, etc. It is evident that this dangerous condition exists only under abnormal conditions and while such conditions exist only infrequently, they are, of course, very serious when they do exist.

The low voltage hazard, on the other hand, exists all the time; that is to say, a person is always subject to a certain amount of shock when coming into contact with certain of the conductors of the utilization circuits, and while, with proper protective measures, the shock voltage may be limited to about 110 volts, the cumulative hazard is very considerable because it is always present throughout the entire wiring system.

The high voltage hazard is much greater in residential and commercial districts where the wires are run overhead and where the low and high voltage lines are carried upon the same poles over a large territory through trees, etc. In industrial establishments, particularly the larger ones, having transformers installed on the premises, the chance of a cross between a high and low tension wire is reduced to a minimum, and about the only possibility of getting high voltage is through a break down in the transformer. On the other hand, the low voltage hazard is much more serious in industrial than in residential or commercial fields due to several factors, perhaps the principal one being the use of portable tools, hand lamps, etc., under conditions where a break down of the insulation is almost sure to result in a more or less serious shock owing to the good conductive conditions which generally prevail.

A safety circuit connected to one of the conductors of the wiring system to which the motors, lights and other utilization equipment is connected is undoubtedly the best and, in fact, about the only method we have of protecting against the high voltage hazard.

The Safety Circuit

The safety circuit as such was first suggested by Professor Elihu Thompson. Strange as it may seem, there has been, until the last few years, very little change in safety circuit construction from that which was used during the early years of the electrical industry. This is the more astonishing when we stop to consider the fact that in the earlier days a 2,200 volt circuit was the highest we had to deal with, whereas today it is not at all uncommon to find 33,000 volt lines on the public highways and transmission systems of voltage up to 220,000 volts are now being used. These, while not on public highways, necessarily cross the highways, here and there, and often cross over the lower voltage systems. Furthermore, the amount of current which could be drawn through a short circuit on the older systems was generally limited. A

dead ground on some of our present day systems may mean almost anything in the way of current volume and explosive force.

Perhaps the most important change, however, is the tremendous increase in the diversity of use and in the ramifications of our present-day electrical systems. The electrical devices in use and the various applications of electricity are too numerous to mention here, but with the general adaptation of electrical service to our every day needs in the home, office, store and factory, there has necessarily come a great increase in the possibilities of electrical shock and furthermore a serious, although somewhat natural, disregard upon the part of the user for the hazards involved.

Difficulties

This tremendous growth and the changed conditions not only make adequate safety circuit construction imperative, but they make it increasingly difficult to obtain, because it is obvious that a safety circuit which might furnish adequate protection on a localized system of small capacity, such as prevailed twenty years ago, might easily be entirely inadequate under present day conditions. In spite of all these changes and while there has been a great deal of improvement in wiring methods generally, there has been, until very recently, no corresponding improvement in the construction of safety circuits.

It is well to note that state labor bureaus and industrial commissions are beginning to take serious notice of the shock hazard in industry and are beginning to formulate regulations of their own, as they feel that the existing codes or, at least, the results that they are obtaining from the existing codes, do not furnish sufficient protection, and this is not to be wondered at when it is possible for three men to be killed in as many minutes from a single portable machine, as recently happened in New Jersey. Such accidents can undoubtedly be prevented by proper safety circuit construction. In at least one instance an effort has been made to put through legislation which would make one criminally liable for accidents when inadequate protection is provided.

While a properly constructed safety circuit applied to one of the conductors of the wiring system practically eliminates the high voltage hazard, it does not eliminate the low voltage hazard, and, in fact, it has sometimes been said to be responsible for the low voltage hazard. The fact is, however, that the low voltage system should have one wire connected to earth, even if no high voltage hazard exists at all, because it actually results in decreasing the low voltage hazard. Most systems are 3-wire; that is, 110 volts between each of two outside wires and a neutral, and with 220 volts between the two outside wires. While only two of the three wires are often used for small installations, it does not alter the fact that the third wire is connected with the system and is used for some other installation not far away.

Accidental Grounds

Now, if a safety circuit is attached to the neutral or central wire, the voltage between either of the other two wires and the earth will be limited to approximately 110 volts, but if no safety circuit is employed and one of the outside wires becomes accidentally grounded, which is bound to happen sooner or later, then there will be a voltage of 110 between the neutral wire and the earth, and a voltage of 220 between the other wire and the earth, and the resulting hazard will be perhaps five or six times as great as it would be had a safety circuit been used. Furthermore, when accidental grounds occur, a safety circuit usually results in the fuses being blown and the trouble being consequently corrected before any serious fire hazard is created.

Polarized Wiring

With one wire connected directly and adequately to the earth by means of a safety circuit there can be no difference of potential between that wire and the earth, so that no shock would be received by anyone touching that wire or any metal parts connected to that wire. This is the basis for the "polarized" system of wiring, which construction is now standard practice in most localities. In the "polarized" system of wiring the wires themselves are identified by colors, one conductor being made white throughout the entire system, while the other conductors are generally black. The white wires are always connected together and it is to this wire that the safety circuit is connected, the connection being made at the main switch. It is very important that no fuses and no switches be installed in the white wire. When a two-wire branch circuit is taken off the white wire is connected through solid, a fuse and switch being used in the black wire only. Obviously, this method of wiring is considerably cheaper than the old method.

Practically all wiring devices are now being manufactured with identified terminals; that is, one terminal is marked with a white coloring and this terminal, of course, must always be connected to the white wire. For instance, in the ordinary screw shell socket, the screw portion is connected to the white wire, while the black wire connects to the small center post in the base of the socket and it is practically impossible for one to get into contact with this stud in the bottom of the socket, while it is comparatively easy to come into contact with the screw shell or with the base of a lamp which is screwed into the shell, but since this part is connected to the white wire, which is equipped with a safety circuit, no shock will result from making this kind of contact. The same general scheme is carried out throughout the whole system or, in other words, the live or dangerous wire is kept on the inside of all fittings, etc., where it is more difficult for anyone to come into contact with it.

Grounding Motors

With the wiring system properly identified and polarized, including, of course, single pole fusing and switching, the permanent low voltage hazard is pretty well taken care of, but we still have the hazard resulting from the breaking down of the insulation in a conduit or other metal wire way, or in a motor or other piece of metal enclosed equipment, because when such a break down occurs there immediately is established a difference of potential between the metal parts involved and the earth, and of course anyone touching these parts becomes subject to shock. This hazard, however, may be easily and quite completely eliminated by applying a safety circuit to all such metal enclosures, or, as we commonly say, all such enclosures should be grounded, which is carried out by connecting these parts to earth.

In designing and installing safety circuits the following features should be given careful consideration:

(1) It should create no fire hazard itself.

(2) The connections should be so arranged that when a burnout occurs, due to one of the ungrounded service

wires coming in contact with the service entrance conduit, the ground connection for the conduit itself will not be injured.

(3) The circuit should provide a proper path for both high and low frequency currents and also for direct current.

(4) The circuit should have as low resistance and impedence and as high carrying capacity as a reasonable cost will permit.

(5) It should be fully protected against mechanical injury.

(6) All connections should be at least as good as those employed for other electrical circuits and must have ample carrying capacity.

(7) The construction should be such that its application need not be limited to any particular locality or conditions.

(8) The construction of the safety circuit should conform to the requirements of the National Electrical Code.

Much has been accomplished in the way of accident prevention by means of the enclosed safety switch, the use of guards, the proper enclosure of live parts, etc., but the shock hazard from metal enclosures still remains a serious and ever-increasing one and considerably more thought and attention can well be given to this matter, especially in connection with portable equipment.

Grounding of Portables*

By W. J. CANADA

Electrical Field Secretary, National Fire Protection Association

TODAY every person is surrounded everywhere, not only by wiring, but by electrical fixtures, portable appliances, etc. It is a part of his daily life. So we must make this electrical living safe, not only from higher voltages than intended to come on the wires, but also from the voltages already and properly on those wires. This involves safety circuits for equipment frames, whether the equipment is stationary or portable.

Is it a new thing to ground equipment and appliances? For years we have been grounding conduit, armor of cable, metal raceways. For years we have been grounding some stationary motor frames, etc. But for these same years we have been omitting to ground many stationary equipments and most portable ones. Fortunately conduit, armor of cable, metal raceways, supplementary safety grounding wires run in non-metallic sheathed cable, provide naturally and without separate treatment and cost, the necessary safety grounding circuits for fixed equipment. The assurance of continued good electrical connections in these safety grounding circuits is, of course, a problem, but the temporary, accidental loss of such a safety grounding circuit connection is only the temporary loss of a protection—not the addition of an active hazard.

More recently it has become our duty, no longer escapable, to provide safety grounding circuits for portable equipment as well as for fixed equipment. Even as recently as ten years ago the number of electrical portables, especially in industrial plants, was negligible. Today we move in and by an army of them. They must not present such frequency of hazard that users get to fear handling them or get to handling them fearfully, slowly or inefficiently. We must use our electrical tools and conveniences confidently—with assured safety.

And so we have, with increasing vigor, attacked the not too easy problem of safety grounding circuits for portables. We have solved it, too. But the solution, naturally, is not yet uniformly used. Even its introduction into general use has been a real problem.

The solution by means of a safety grounding conductor carried with the current carrying conductors, in the same flexible cord connection, has been long recognized as meritorious. Its use in actual practice has increased with gathering force, and today it is proposed for general application to all industrial portable appliances. It involves safety grounding terminals on plugs and receptacles. These have been developed and are in wide use. It involves clear identification and non-interchangeability of wires and terminals. This has been secured.

In the course of consideration of this safety problem some consideration has also been given to the possibility of using one of the circuit wires itself for grounding portable appliance frames. Thus far the consideration has appeared to indicate the existence of certain dangers, probably greater than exists where portable appliance frames are not grounded at all. Any presumed safety in use of a circuit wire for grounding a portable appliance frame is at the mercy of several variables, such as—

(1) Whether the circuit wire is, in in fact, a grounded one.

(2) Whether it can be relied on to stay grounded.

(3) Whether its own grounding is adequately good.

(4) Whether it can be relied on to remain the grounded wire of the wiring system even though identified for some kinds of wire sizes and for some kinds of circuits and systems. In other words, who guarantees and how, against reversals, change of system, etc., etc.

(5) Whether it can be relied on against breakage, open circuit at one of its many connections, etc.

It may be briefly noted that if any one of these five possible causes of unreliability with their many subdivisions were to result in a failure of the so-called grounded wire to be and remain so—then the frame supposed to be safeguarded not only loses a safeguard temporarily, but also has imposed upon it a real hazard—the full voltage of the circuit to which the appliance is connected, and this without any insulation breakdown whatever within the appliance itself.

There are certain theoretical and certain conjectural advantages in the use of a circuit wire for grounding, and in due time such a degree of assurance against such dangers as noted may be found as to warrant some trial of such method under clearly expressed restrictions, but such time is not yet.

*Abstract of discussion of Mr. Runyon's paper on Protective Grounding presented at December 3rd meeting at Reading, Pa., of Association of Iron & Steel Electrical Engineers.

Wiring Standards Must be Protected for the Public Good

By A. PENN DENTON
Chairman, A. E. I. Code Committee
Chairman, N. E. C. Article 5 Committee

THE electrical industry is undertaking today a program in market building which will require the closest co-operation between all branches of industry if we carry it through to completion. This market building, while primarily a sales problem, has to do with adequate rewiring of sixteen million homes which are now using electricity so incompletely.

The National Electric Code provides us with many types of interior wiring with which to wire these homes, but with all of these methods, we have not reached a place in the development of our industry where it can be said we have no further need for progress in the art of wiring—and here we shall stop.

The electrical wiring standards of the present Code have been thirty-five years in the making, and yet it has only been within the past four years that a procedure has been adopted by the industry whereby order has replaced haphazard revision of old standards and the making of new ones for wiring installations.

Our electrical industry has not yet realized the possibilities of this new procedure. It is still concerning itself with many old ideas and traditions in Code making which should have been discarded years ago. Every type of wiring given us in the Code today shall prove helpful to our industry in extending our market for a wider use of electrical service. Our standardization procedure from this time on must protect each type of wiring according to its merits, while at the same time permit of new developments and progress of the art.

Under the old order of Code revision the separate industry groups did not pull together in providing the public with the best possible electrical service. For that reason many of the wiring standards of the Code were too often commercial issues which seldom represented the best co-ordinated thought of our engineers and commercial men.

The basic factor underlying the standards for wiring installations of the Code is safety from the standpoint of the fire and life hazards. No attempt was made for years to provide in the Code due consideration for use and occupancy features of the different wiring methods. Rapid strides have been made in improving all kinds of building materials and construction while those interests responsible for improved wiring methods lagged far behind other industry development.

The public demand in all sections of the country for better and safer wiring has within recent years brought continually to the attention of the Electrical Committee of the National Fire Protection Association the need for recognition in the Code of "where" and "how" all types of wiring may be used. The administrators of our Code are asking for this treatment of future standards, while the manufacturers, the central stations, and the contractors are beginning to realize the great importance thereof.

We, therefore, have reached the place in our program for an orderly improvement in the revision work of the Code, where each group of our industry must recognize its individual responsibility. Our interior wiring situation demands the co-ordinated efforts of all industry groups. The wiring standards must all be protected for the public good. This means that no group or single interest within a group may exploit some type of wiring for personal or selfish reasons. No one interest can control and it shall only be through a united industry effort following the splendid procedure which we now have set up, that will provide the safe, efficient, and adequate wiring installations of the future, so necessary to success in building the great future electrical market.

Our Electrical Field Service has accomplished much in the aid it has given to the Electrical Committee, and particularly to the article committees; but this field service work must be greatly supplemented by individual group action along these same lines. There is an immediate need for a Code and Standards staff in the National Electrical Manufacturers' Association, the National Electrical Light Association, the International Association of Electrical Inspectors and the Association of Electragists, Int. All of the group staffs for Code and Standards work can materially strengthen the united and constructive participation of its own organization in bringing about an orderly control of our wiring situation for the good of all. All of these staffs need to be strong, friendly, courageous, far seeing, free from bias toward or against any unit within their particular branch of the industry.

Let each group of our industry take unto itself the responsibility which rests upon it. May we frankly discuss these problems in our Electrical Field Service Committee for our common good. Then and only then can we hope to build that public confidence which in the last analysis, is all important to the future expansion and growth of the electrical industry.

Lighting for Safety

The Holland Vehicular Tunnels Under the Hudson River Bring up New Problems in Tunnel Lighting

A NEW note in lighting was sounded November 13 when the Holland vehicle tunnels, for automobile traffic between New York and New Jersey, were opened to the public. An attempt was made in this lighting installation to simulate natural outdoor lighting as near as possible, so that an automobile driver, going from bright daylight outside into the tunnel, would not go into a dark area where it would be difficult for him to see, and in which the chance of accident would be very great. The problem was complicated by the fact that the tunnel is used at night, too, and the light must be suited to a driver entering the tunnel from the less intensely lighted night streets at either end.

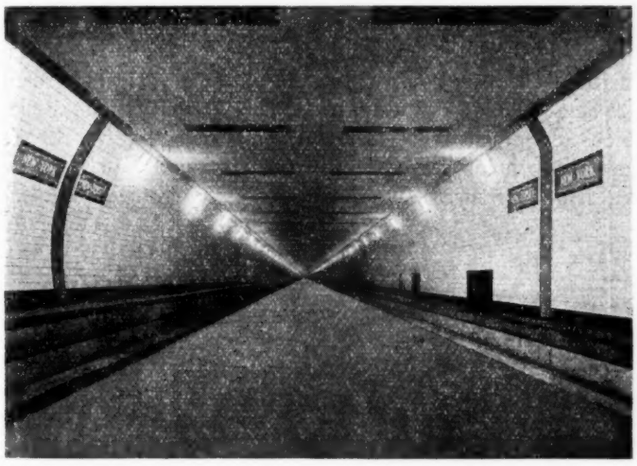


Fig. 1—Interior View of One of the Tunnels
The lighting units in the upper side walls provide uniform diffused illumination without glare.

After considerable study of tunnels throughout the world (there are none which compare very closely with the Holland tubes, and numerous tests of all sorts it was decided to install individual light units spaced on 20 ft. centers, opposite each other, with a 150 watt, 115 volt, clear bulb Mazda C lamp in each unit. The units are set into the wall, and a cover of opal glass diffuses the light so much that one can look directly at the light source without suffering from glare. However, since the units are set near the ceiling and direct the light across the highway, it is never necessary for the driver to look at the light source, and most drivers are not conscious of the source of light at all. At the entrance and exit of each tunnel the light units are on 10 ft. centers and twice the illumination is thus provided, the intensity gradually decreasing to the interior of the tunnel and then increasing at the exit. The more intense light near the entrance is to simulate more closely the conditions of daylight outside the tunnel, while a lesser intensity is permissible in the center of the tube as the eye can easily adapt itself to a gradually decreasing light intensity. So successful is the handling of the light intensity and the elimination of glare by the use of opal glass diffusing covers that many people driving through the tunnel do not notice how the tunnel is lighted.

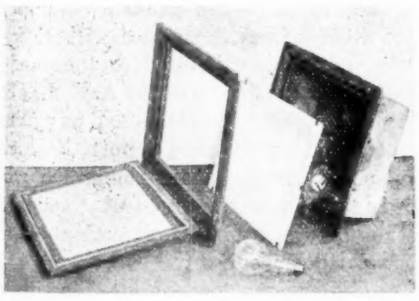


Fig. 2—Lighting Unit Disassembled
Bronze frame door with opal glass cover, porcelain enameled cast-iron reflector, outer cast iron box which is set in the concrete lining of the tunnel.

Tests have been made by engineers of the Westinghouse Lamp Company, who designed the light unit, which indicate that the light intensity in the tunnel is 1.22 foot-candles on a horizontal plane two ft. above the roadway. The intensity seems much greater than that because the walls and ceiling are of white tile, which reflects the light with the maximum efficiency. The intensity in the tunnel, according to D. W. Atwater of the Illumination Bureau, Westinghouse Lamp Company, is far greater than that in the average street at night, and because of the white walls it appears greater than State Street, Chicago, in which the measurable intensity is considerably more and which is the brightest lighted street in the world.

No attempt was made to simulate daylight by a "daylight" glass or blue cover glass, because this would give an odd effect at night, and the problem was to create sufficient light, the source of which should be inconspicuous.

Among the possible methods of tunnel lighting which were tested and rejected was that of having deep bowl reflectors in the upper side walls, tilted downward and aimed in the direction of traffic, so that the light would fall on the roadway with the source in back of the drivers, since each tunnel is a one-way road. It was found, however, that in this type of light the cars following any one driver cast huge shadows ahead on the walls of the tunnel which were very distracting, and this was rejected as unsatisfactory. Another suggestion was to have the light units in the ceiling, projecting the light directly downward onto

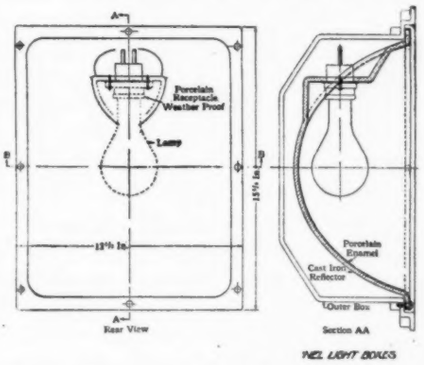


Fig. 3—Cross-section of the Lighting Unit

the roadway. When this was tested it was found that the pavement was well illuminated, but that alternate bright and dark spots on the ceiling ahead gave a "tunnel-like" appearance which might have distracted the attention of the drivers, and this was not desired. Various angles of tilt across the tunnel were tried, having the reflectors in the side walls close to the ceiling, with the result that the best effect was obtained when mounted parallel with the wall at an angle approximately 20 deg. to the vertical. The diffusing covers not only reduce the brilliancy of the light source but also soften the shadows of moving vehicles. Tests were made to determine whether or not it would be wise to stagger the light units on opposite sides of the tunnel, but this seemed to have little effect on the uniformity of the illumination and produced more unpleasant shadows than the system of having the light sources opposite each other.

The specially designed lighting unit is shown in Fig. 2. The outer cast iron box was set in the concrete lining of the tunnel. Bolted to this is a porcelain enameled cast-iron reflector. The opal glass cover, in a bronze frame, is easily opened for lamp renewals. Efficiency tests indicate a 68 percent output without the cover and 38 percent with the cover closed.

The electric service is provided from six different power houses independently routed and any one of the six cables could carry the entire electrical load if necessary. The lamps are burned in multiple, alternate lights being served from New York and New Jersey. The main feeders operate at 2,300 volts 60 cycle, A. C. and the voltage is stepped down by transformers located throughout the tunnel to 115-230.

At the entrance and exit plazas special outdoor lighting is necessary for night. An entire city block was razed to make the New York City entrance plaza. Lamps as large as 2,000 volts are hung in pendant lanterns, two to a pole, and there are a total of 111 pendants of this type and 41 single upright lanterns in the two plazas. The light is supplied from the main tunnel service.

Every 240 feet throughout the tunnel is a traffic signal light which flashes green, red, or yellow to control the traffic. Traffic officers stationed every 480 feet can control these lights locally by switches, but they are usually controlled from a master switch.

Plan of Electragist Standards for Wiring Installations

A PRELIMINARY draft of certain parts of the Electragist Standards for Wiring Installations was published in December by the Association of Electragists, International, this being the first release of the results of the work of the A. E. I. Standards Committee. A comprehensive idea of the scope and arrangement of the entire project may be obtained from the "Plan" or general outline and the statement of the purpose of the Standards reproduced here. The sections included in this printing are those entitled Purpose, Definitions, Types of Wiring Approved Under Given Conditions and General Requirements, this last section being only partially completed.

It was found necessary to define a number of electrical terms commonly used in referring to wiring installations. In many cases existing definitions were found inadequate in that they were not sufficiently explicit. New or more restricted meanings are given to certain terms and a few new terms are introduced, as "Equipment Box" and "Access Fitting." The definitions are the result of a great deal of study by the committee and if they are favorably received both by contractors and by the other branches of the industry it is hoped that they may eventually become American Engineering Standards. The general adoption and use of these definitions would greatly help to clarify specifications and contracts.

By referring to the Plan it will be seen that a radical departure has been made from the arrangement of electrical codes. Section IV specifies the types of wiring which are approved under any given conditions, but there are no rules here governing the methods of installing the various types of wiring. Section V is general requirements covering services, grounding, automatic overload protection and insulation resistance. Section VI will take up all wiring materials and electrical apparatus insofar as the apparatus has any bearing on wiring methods and will contain such specifications as are pertinent for the material or apparatus itself, and specifications for methods of installation.

It is obviously desirable that the Standards shall be acceptable to all branches of the electrical industry insofar as this result can be secured without interfering with the purpose of the Standards as here set forth. In furtherance of this policy a number of conferences have been held with representatives of the Panelboard Section of the National Electrical Manufacturers' Association relative to the subject of definitions, and it is anticipated that there will be occasion for many more such conferences both with representatives of the N. E. M. A. and of the other national organizations.

This preliminary draft is now in the hands of the technical advisory committee on the Standards, which has about 200 members distributed over all parts of the U. S. A. and Canada. Members of this advisory committee will discuss the material submitted to them with other local members of the A. E. I., also with their local inspectors and any other interested parties, and report the local consensus to the main committee who will give these reports full consideration before issuing any section as an official document.

It is the purpose of the Electragist Standards for Wiring Installations to define what constitutes best practice in wiring installations.

In determining what constitutes best practice, the considerations involved are those of safety to life and property, permanency, adequacy, efficiency and economy of operation, with proper regard for cost. Safety to life and property must always be assured. The degree of permanency and adequacy and the cost of the installation must in every case be commensurate with the charac-

Electragist Standards for Wiring Installations

PLAN

SECTION I Purpose

SECTION II Definitions

SECTION III Engineering Designs of Installations
(In preparation.)

SECTION IV Types of Wiring Required Under Given Conditions

A—Atmospheric and Location Conditions.
- A-1 Moist Air Containing Salt in Sufficient Quantity to Produce a Decided Corrosive Effect on Iron and Steel, or Its Protective Coating.
- A-2 Exterior of Buildings Subject to the Weather.
- A-3 Underground.
- A-4 Under Water.

B—Building Construction.
- B-1 Concealed Wiring in Fireproof Construction in Which the Wiring is Completely Imbedded in the Building Material.
- B-2 Concealed Wiring in Fireproof Construction in Which There are Continuous Open Spaces.
- B-3 Concealed Wiring in Wood Frame Construction.
- B-4 Exposed Wiring in Fireproof Buildings.
- B-5 Exposed Wiring in Non-fireproof Buildings.

C—Occupancy.
- C-1 Occupancies Not Covered Below.
- C-2 Residences.
- C-3 Outbuildings.
- C-4 Garages.
- C-5 Places of Public Assembly.
- C-6 Motion Picture Film Handling Occupancies.
- C-7 Water, Wiring Subject to Condensation and Streams of
- C-8 Corrosive Fumes, Gases or Condensation, Wiring Subject to
- C-9 Heat, Wiring Subject to Excessive
- C-10 Hazardous Locations.
- C-11 Extra Hazardous Locations.

D—Use.
- D-1 Cranes, Hoists, Transfer Tables.
- D-2 Elevators.
- D-3 Signs, Outline Lighting.
- D-4 Machinery.
- D-5 Temporary Work.
- D-6 Low Voltage Isolated Plants.
- D-7 Organs.
- D-8 Signal Systems.
- D-9 Radio.
- D-10 Voltages Over 600 Volts.

SECTION V General Requirements

A—Services.
- A-1 Overhead Services.
- A-2 Underground Services.
- A-3 Location of Service Switch and A.O.P.D.
- A-4 Type of Service Switch and A.O.P.D.
- A-5 Minimum Size of Service Conductors.
- A-6 Grounding.

B—Grounding.
- B-1 System Ground.
- B-2 Separate System and Equipment Ground.
- B-3 More Than One Service.

C—Automatic Overload Protection.
- C-1 Conductors.
- C-2 Motors.
- C-3 Generators.
- C-4 Converters.
- C-5 Batteries.
- C-6 Rectifiers.
- C-7 Heating Apparatus.

D—Insulation Resistance.

SECTION VI Specifications for Materials and Apparatus and their Installation
(In preparation.)

1. Conductors.
2. Conduit.
3. Outlet Boxes and Access Fittings.
4. Armored Cable.
5. Non-metallic Sheathed Cable.
6. Raceways.
7. Wireways.
8. Insulators.
9. Guards.
10. Cabinets and Equipment Boxes.
11. Fuses.
12. Switches.
13. Circuit Breakers, Contactors.
14. Panelboards.
15. Switchboards.
16. Plug Receptacles.
17. Fixtures, Lamp Receptacles, Sockets.
18. Lamps, Tube Lighting.
19. Generators, Converters and Control Equipment.
20. Motors and Control Equipment.
21. Transformers.
22. Batteries and Control Equipment.
23. Rectifiers and Control Equipment.
24. Heating Apparatus.
25. Cranes, Hoists.
26. Elevators.
27. Resistance Devices.
28. Lightning Arrestors.
29. Pole Lines.

ter of the building structure, the character of the occupancy of the building and the character of the service to be provided by the wiring installation.

"Best practice" must not be assumed to mean the most costly wiring installation in every case; the end to be sought is an installation having a sound investment value. Certain conditions exist which call for comparatively inexpensive wiring installations; in some few instances the conditions dictate the use of materials and types of wiring which are of the highest quality obtainable at any price; while in the great majority of installations the proper balance between cost and true value is secured by employing materials and installation methods which are by no means the cheapest but at the same time are not the most costly, and by engineering design which provides adequacy without waste or extravagance.

It is not the purpose of the Electragist Standards to set up new standards of any nature where satisfactory standards have already been established by other agencies.

There are at the present time in the United States two recognized national codes, the National Electrical Code and the National Electrical Safety Code. There is one such code in Canada, the Canadian Electrical Code. These codes are necessarily minimum standards for protection, designed only to insure safety to life and property, and it is entirely outside their scope to cover all the other considerations which are involved in best practice.

No provisions of the Electragist Standards will be found to be in conflict with the National Electrical Code. As a rule, the Code requirements are not repeated in the Standards, but it is to be understood that in order that an installation may be in accordance with the Electragist Standards, all requirements of the National Electrical Code must be complied with.

Rehabilitation Discussed

Rehabilitation of old buildings, including rewiring as well as modernization of other features of out-of-date homes, was the subject of discussion at the sixth annual convention of the American Construction Council in St. Louis, Mo., December 1-3. The interrelation of the various industries and the possibility of increased markets for all the building trades was considered.

Estimating Methods---VII

Branch Circuit Work
Pipe Entrances
Types of Construction
Size Factors
Layout Factors
General Contractors

By ARTHUR L. ABBOTT
Technical Director, Association of Electragists, International

IN a previous chapter the general operation of installing any large size of conduit was analyzed and found to consist of transporting the pipe, cutting and threading, coupling, bending and attaching to boxes. This analysis applies equally well to ½-in., ¾-in. and 1-in. conduit used for lighting branch circuits, or for telephone or other low tension work when the conduit is installed in the same manner as the lighting branches.

No factory-made elbows are used with the three smaller sizes, or at least none should be used, so this item is eliminated. Another item is added--the outlet box. Outlet boxes or some other form of access fittings being a necessary part of every branch circuit installation, the boxes and conduit must be considered together.

Branch Circuit Work

In working out labor units which would apportion the labor on large conduit to the items which are actually responsible for the labor, we found it necessary to determine the quantity of conduit, also the number of elbows, terminals or pipe ends, and bends. On the branch circuit work in all but a few special classes of work, practically all the bends that occur are associated with the pipe terminals and so are most easily accounted for by including the bending labor with the terminal labor. All the cutting and threading required is in connection with the terminals; the same reasoning holds good here as in the case of terminals in large pipe, and it was shown that each terminal requires as an average ¾ of one cut and thread. Each terminal also must include attaching the conduit to the outlet box or cabinet with a locknut and bushing.

Labor on the conduit can therefore be reduced to two items. One is hours per 100 ft. of conduit, which includes only the time to handle the conduit and couple the lengths together. This is a small item and has been determined as 1.2 hr. per 100 ft. for ½-in., 1.5 hr. per 100 ft. for ¾-in., and 2.1 hr. per per 100 ft. for 1-in. for all classes of construction where the conduit is built into concrete floor construction or is laid on top of the finished slab and built into the floor fill. For ½-in. the above figure means that .6 hr. or 36 minutes is allowed for two men to carry 100 ft. of conduit from a nearby stock pile, distribute it on the form work and couple the lengths together. The work would be slowed down somewhat in some cases due to the difficulty of working on the form work and reinforcement, but the pipe item is a small part of the labor and for the sake of simplicity it is better to use the above standard figures rather than to use any figures differing only slightly from one another.

In installing exposed work, also some forms of concealed work in wood frame construction, the conduit is placed on the ceiling instead of on or in the floor slab, and all runs must be parallel to the building walls, which requires frequent right-angle bends. A larger allowance must therefore be made for labor. The figures used here are 2.2 hr. per 100 ft. for ½-in., 2.7 hr. per 100 ft. for ¾-in., and 3.8 hr. per 100 ft. for 1-in.

Pipe Entrances

The other item of conduit labor is that on the pipe terminals which, in order to distinguish between large pipe work and branch circuit work, are called "pipe entrances". The amount of work that must be done to bring a conduit into an outlet box or cabinet varies within wide limits, depending upon the class of building construction, the location of the outlet, and whether the conduit is concealed or exposed. The labor figure is on the order of 25 hr. per 100 pipe entrances into ceiling boxes for ½-in. conduit in ordinary classes of construction, or ¼ hr. each; if two men work together, the time is 12½ minutes for the team. Entrances into all outlets in the walls in a fireproof building require considerably more time, because it is the exception rather than the rule when a conduit can be stubbed down to a wall outlet without offsetting, and because this work is invariably delayed by the slow progress of the other trades.

Beside the labor on the conduit, the outlet box itself requires some labor, principally locating and securing in position. The time varies from about 15 hr. per 100 for ceiling outlets built into concrete floors to 36 hr. per 100 for outlets in fireproof walls, or may be even higher in some special cases.

Summing up the situation then, the total labor on branch circuit conduit and outlet boxes is to be computed by applying suitable labor units to three items: Conduit, pipe entrances, and outlet boxes.

Fundamental Principles

This method varies from the more common practice in that the estimator must make a count of the pipe entrances, something that many estimators strenuously object to doing. However, the estimator can still make use of the labor data here presented, even though he may consider it more practical under his own working conditions to shorten his work rather than to strive for the maximum of accuracy. Short-cut methods based on the more detailed labor data will be fully discussed in a future installment. The intelligent application of short-cut methods requires a highly developed judgment and a thorough understanding of all the fundamental factors involved, therefore it is quite necessary that the more detailed methods should be carefully studied first.

Because the actual operations to be performed by the workman are different in different kinds of floor and wall construction, it is evident that for any

given installation, labor units should be used which apply to the particular class or classes of building construction found on that job. As has already been stated, in estimating labor it is far better to refer to printed or written data rather than to depend upon a mental record. If the estimator is to consult his data book, no complication is introduced by the fact that he must refer to one particular table instead of some other.

Complete labor data for branch circuit conduit work in most of the common classes of building construction are presented in Table 7. In order that the reader may be enabled to make immediate use of these unit times the detailed discussion of the data will be postponed and the adjustment of the figures to suit the conditions on the job will be taken up first.

Types of Construction

It is well known to all men who are experienced in electrical construction work that the branch circuit conduit installation is frequently subject to delays and that the character of the work in one type of building may cause a higher or lower labor cost than in some other type of building. For this reason it is not right to use the same unit labor costs even for all buildings of the same class of construction, but the labor units must be modified to fit the conditions on each individual job. This is nothing new; it is the common practice of all competent estimators to make this adjustment in some way.

In this system of estimating, having for very good reasons adopted the practice of making use of definite labor data set down in black and white, it follows that in order to be consistent any necessary adjustment of the data should also be made in as definite a manner as possible.

The method adopted for adjusting the branch circuit labor units is believed to be the simplest possible solution of the problem. The intention is to set the labor units so low that they represent a rate of production which can only be maintained when all conditions on the job are the most favorable to rapid work; then when any unfavorable conditions are known or anticipated, an addition is made to the total labor, and the estimator is asked to set down the percentage which is added on account of each of the conditions. In other words, the tabulated units are base figures, and in nearly all cases some percentage is to be added to the total as calculated from the base figures. The percentage to be added is known as the "Job Factor" and it is recommended that it be calculated for each job as follows:

The most important of the job conditions which may affect the cost of labor on the branch circuit conduit work are the size of the building, the general type of the branch circuit and low tension layout, and the methods employed by the general contractor.

Size Factors

The building size, or more strictly speaking, the area of a single floor of the building, affects the branch circuit roughing-in labor chiefly by causing a stoppage of work between floors, unless the floor area is sufficiently large so that when the floor construction is once started the roughing-in work is continuous. The class of building construction and the location of the property will have a bearing on this.

The maximum loss of time percentage caused by stoppage of work between floors will evidently occur on the smallest building and will decrease as the area per floor increases. This maximum loss is considered as requiring 25 percent additional labor. In a building constructed entirely of reinforced concrete, or in a steel frame building with wide spans and built in a location where the ground values are not so high as to enforce extreme speed in construction, the conduit in each case being built into concrete floor slabs, the point of no stoppage between floors is considered as being reached at a floor area of 60,000 sq. ft. per floor. For such a building the following percentages are to be added to the total branch circuit roughing-in labor as a "size factor".

TABLE A—SIZE FACTOR
Usual Conditions

Area—Square Feet	Percentage to be added
500	25
1000	24
2000	22
3000	20
4000	19
6000	16
8000	14
10000	12.5
15000	9
20000	6.5
30000	3.5
40000	1.5
60000	0

The class of construction universally employed for tall buildings in the parts of New York City where ground values are very high is steel frame with reinforced concrete floors, the span between supporting steel beams usually being about 6 ft. The form work for the concrete slabs is supported from the steel frame. Construction proceeds very rapidly on these buildings and the zero point of the "size factor" may be taken at 30,000 sq. ft. area per floor. It is probable that the conditions are similar in the other larger cities. The percentages to be used under these conditions are as follows:

TABLE B—SIZE FACTOR
Special Conditions

Area—Square Feet	Percentage to be added
500	25
1000	22
2000	19
3000	15
4000	13
6000	9
8000	5
10000	3.5
15000	1.5
20000	1
30000	0

All the above figures apply to work which is built into poured concrete floors. There are certain cases which must be handled in a somewhat different manner. If the floor construction is flat tile arches, the conduit is laid on top of the tile instead of being built in, and even when the floors are poured concrete, the conduit work may be laid on instead of in the slabs. When the work is done in this way, it is usually safe to assume that the branch conduit work need not be started until several floors are constructed, so that when once started the work will be continuous.

A similar condition exists on buildings of wood frame interior construction; usually the branch conduit work will go ahead without stoppage once the work is begun. Likewise, in the case of exposed work there is no delay waiting for the building construction to progress.

In all these cases the size factors should be taken from Table A, *but the area used should be the total area of all floors in the building, including the basement, instead of the area of only one floor.*

Layout Factors

The second of the more important conditions affecting the labor cost of

the branch conduit work is the type of layout. An example of an extremely simple layout is a warehouse having one outlet in the center of each bay, and almost no switches or other outlets. On the other hand, in a large modern hotel building, the branch circuit layout on all floors is very complicated; there are numerous low tension systems extending to various parts of the building, and many of the outlets must be located with great care. Additional time is spent on such a job in consulting the plans, in checking the work during installation, and in final checking and

TABLE 7—BRANCH CONDUIT WORK

	Hours per 100			
	½-in.	¾-in.	1-in.	Box
Class A—Reinforced Concrete, Flat Slab or Slab and Beam With Concrete Columns				
Conduit—per 100 ft.	1.2	1.5	2.1	
Pipe Entrance to Ceiling Box—				
Deep box, no offset	18	21	36	
Shallow box, with offset	26	30	48	
Ceiling Outlet Boxes				15.3
Class A1—Reinforced Concrete, Steel Frame				
Conduit—per 100 ft.	1.2	1.5	2.1	
Pipe Entrances to Ceiling Box	26	30	48	
Ceiling Outlet Boxes				15.3
Class B—Reinforced Concrete Slab With Concrete Joists and Tile Filler				
Conduit—per 100 ft.	1.2	1.5	2.1	
Pipe Entrance to Ceiling Box	27	30	49	
Ceiling Outlet Boxes				17.5
Class F1—Steel Pan Construction With All Outlets in Beams				
Conduit—per 100 ft.	1.2	1.5	2.1	
Pipe Entrances to Ceiling Box	27	30	49	
Ceiling Outlet Boxes				14.
Class F2—Steel Pan Construction—Pans Not Removed, Metal Lath and Plaster Ceiling, Outlets in Beams or Pans Blanked Off for Outlets				
Conduit—per 100 ft.	1.2	1.5	2.1	
Pipe Entrances to Ceiling Box	27	30	49	
Ceiling Outlet Boxes				25.
Class F3—Steel Pan Construction—Pans Removed, Metal Lath and Plaster Ceiling, Outlets in Beams or Pans Blanked Off for Outlets				
Conduit—per 100 ft.	1.2	1.5	2.1	
Pipe Entrances to Ceiling Boxes	27	30	49	
Ceiling Outlet Boxes				18.
Class F4—Steel Pan Construction—Pans Not Removed, Metal Lath Placed With Floor, Holes Cut in Pans for Pipe and Boxes				
Conduit—per 100 ft.	1.2	1.5	2.1	
Pipe Entrances to Ceiling Boxes	27	30	49	
Ceiling Outlet Boxes				40.
Class J—Walls of Tile, Gypsum Block or Brick				
Conduit—per 100 ft.	1.2	1.5	2.1	
Pipe Entrances to Wall Box	63	73	98	
Wall Outlet Boxes				36.
Class S—Suspended Ceiling Work				
Conduit—per 100 ft.	1.2	1.5	2.1	
Pipe Entrances to Ceiling Box—				
Case 1—When pipe is built into the floor slab and stubbed down to box	59	65	98	
Case 2—When pipe is run in ceiling space	30	33	52	
Ceiling Outlet Boxes				19.

	Hours per 100			
	½-in.	¾-in.	1-in.	Box
Class D1—Wood Frame Construction Double floor, no strips, joists notched				
Conduit—per 100 ft.	3.9	4.3	5	
Pipe Entrances to Ceiling Box	31	35	54	
Ceiling Outlet Boxes				21.
Class D2—Wood Frame Construction Double floor, ⅞-in. strips between rough floor and finished floor				
Conduit—per 100 ft.	1.2	1.5	2.1	
Pipe Entrances to Ceiling Box	31	35	54	
Ceiling Outlet Boxes				27.
Class D3—Wood Frame Construction Double floor, ⅞-in. strips between joists and lath				
Conduit—per 100 ft.	2.1	2.7	3.8	
Pipe Entrance to Ceiling Box	24	27	45	
Ceiling Outlet Boxes				21.
Class D4—Wood Frame Construction Conduit run in unfloored attic space				
Conduit—per 100 ft.	1.2	1.5	2.1	
Pipe Entrances to Ceiling Box	31	35	54	
Ceiling Outlet Boxes				21.
Class M—Wood Frame Construction Work in walls of wood studs with wood or metal lath and plaster				
Conduit—Use same labor units as given for work in floors in the same building				
Pipe Entrances to Wall Box	43	46	68	
Wall Outlet Boxes				22.
Class E—Exposed Work on Any Type of Building Material, not including fastenings or supports				
Conduit—per 100 ft.	2.1	2.7	3.8	
Pipe Entrances to Ceiling Box	24	27	45	
Pipe Entrances to Wall Box	25	28	47	
Ceiling or Wall Outlet Boxes				12.
Class E1—Exposed Work on Wood Including fastenings, pipe straps secured with nails				
Conduit—per 100 ft.	2.5	3.0	4.4	
Ceiling or Wall Outlet Boxes				72.
Class E2—Exposed Work on Wood Including fastenings, pipe straps secured with wood screws				
Conduit—per 100 ft.	2.8	3.3	5.7	
Ceiling or Wall Outlet Boxes				72.
Class E3—Exposed Work on Cinder Concrete Including fastening with Rawlplugs				
Conduit—per 100 ft.	3.5	4.0	6.5	
Ceiling or Wall Outlet Boxes				77.
Class E4—Exposed Work on Brick Including fastening with Rawlplugs				
Conduit—per 100 ft.	4.0	4.6	7	
Ceiling or Wall Outlet Boxes				81.
Class E5—Exposed Work on Hard Concrete Including fastening with lead shields and screws				
Conduit—per 100 ft.	6.0	7.0	9.0	
Ceiling or Wall Outlet Boxes				107.

making small changes before the building finish is applied. There is quite evidently a difference in this respect between different types of buildings which should be recognized by the estimator. Allowances to be added to the base labor costs to cover this condition are given in Table C for a number of typical classes of buildings. The estimator can determine a suitable percentage o use for a type of building not listed by considering the general nature of the layout and comparing this with the types listed in the table.

TABLE C—LAYOUT FACTOR

Type of Building	Percentage to be added
Small 1-story building, simple layout Warehouse, simple layout	0
Factory, simple layout for light and power	1
2 or 3-story store building, light and power	3
Office building, upper floors typical	4
Large hotel, apartment, department store, school building, hospital	5
Large bank	6
Large church	7
Large theatre	8
Large residence—Club House	10

The third condition, which must be given consideration as having a decided effect on the branch conduit labor cost, is the manner in which the building construction is handled by the general contractor. No one will dispute that this is a cost factor of much importance. If it is remembered that the tabulated data in Table 7 are base figures intended to apply only where all conditions are highly favorable, it will be seen that it is necessary to increase these figures to cover the slowing-down caused by the general contractor in every case, except where it is known that he will carry on his work rapidly and will in every way cooperate with the electrical contractor, rather than the reverse. We may properly consider the net results in this respect as dependent upon the general contractor's efficiency, for it is his business to complete the building in a reasonable time and at a reasonable cost to the owner. If by reason of his inability to make rapid progress on his own work or lack of cooperation the cost of the electrical work is increased, the builder is surely to this extent inefficient.

The maximum percentage to be added to this part of the labor cost is taken as 15 percent. When, as is often the case, the general contractor is unknown, the estimator must either take a chance or play safe. In this case an addition of 10 or 12 percent would be conservative and 5 percent would be low. If the habits of the builder in handling work are well known, a percentage must be decided upon which will fit the conditions, between the limits of 0 for the most efficient builder and 15 percent for the poorest.

Having determined the three percentages, these three figures are to be added together and the sum is the percentage to be added to the total hours of labor on the branch circuit conduit as computed by using the labor units taken from Table 7.

The conditions enumerated above have little or no effect on the labor on other parts of the wiring installations, therefore the addition is to be made only to the branch circuit work and the similar parts of the job, such as branch conduit and outlet boxes for public telephone wires and for any of the various low-tension systems.

Job Differences

Perhaps the chief value of this discussion of the "Job Factor" may be to forcibly call the estimator's attention to the fact that there are very real differences between jobs. The estimator who is comparatively inexperienced will do well to adhere closely to the data presented here. The percentages added as allowances to cover the three conditions may be changed if the estimator's experience has proven that by modifying the data somewhat it will more truly represent the actual facts, and if on certain jobs special conditions exist which will affect the labor cost, these should be taken into account as well as the three discussed here. By far the most important principle involved is the setting down on the estimate sheets of a definite allowance for each condition in such form that it is perfectly clear just what each allowance covers. It has been common practice to make these allowances by means of more or less haphazard modifications of the individual labor units. This is an unsystematic and unscientific method, leading to the result that after the estimate is completed, the estimator does not know how much he has added or deducted and would be unable to state his reasons for what he has done.

The Enemy Within the Gates

(Continued from page 20)

he contributes to a lax credit situation and makes it difficult for the jobbers to keep from putting more contractors in the field.

(2) Direct Buying. There is seldom any necessity for a contractor or dealer to buy direct from a manufacturer. If the jobber gets only the small pick-ups he cannot operate profitably. Group buying by contractors and dealers direct from manufacturers is equally to be condemned because it cannot be done as economically and it makes it difficult for the jobbers to operate effectively.

E—Substitution of Lower Quality Material. This practice only encourages the not-to-be desired manufacturers and sometimes forces other manufacturers to produce sub-standard lines. It is unethical and retards progress.

F—Restrictive Legislation. Attempts to restrict competition by legislation are unwise and never effective.

G—Lack of Interest. The contractors and dealers must take more interest in organization affairs. They must get into local programs and become a part of the picture. When something is being done as an industry matter they should put their shoulder to the wheel and not sit idly back and engage in a lot of aimless destructive talking.

With such a discordant situation within the electrical industry how can we ever hope to meet the competition of other industries?

This internal competition has made the business very unprofitable to many. One can hardly expect a person to grow enthusiastic over a business in the red.

Our prayer is that in the New Year 1928 the directors of the Society for Electrical Development may have the courage to call the electrical industry together to fight not only the enemy without our gates—but the enemy within as well.

We need an industry survey and analysis of our internal economic disturbances. We need a conference of big minded men—men with ability and authority to think and act—men who will come with a clean mind and disposition not actuated by self interest, anxious to know the facts, willing to abide by the result.

God grant us this prayer!

A different slant on

European Wiring Practice

Insurance Expert Attacks Edison Association Report Which Recommended Use of Modified Form of Wiring System Found Abroad

By F. D. WEBER,
Electrical Engineer, Oregon Insurance Rating Bureau, Portland, Oregon

HAVING been fortunate enough to take a three months' tour of ten countries of Europe this summer and being interested in all things electrical, I observed closely the general wiring schemes employed in the various countries visited. The countries which I am in a position to discuss are France, Italy, Switzerland, Austria, Germany, Belgium, Holland, England, Ireland, and Scotland, and because of the radical position taken by the Edison Salesmanagers' Association in their report presented to the Association of Edison Illuminating Companies, Colorado Springs, and published in the *Electrical World* for November 26, 1927, I feel that it is my duty to state in a general way that wiring observed in the parts of Europe that I visited is actually very primitive as compared with American practice.

Muckracking

After carefully reading the above report I fail to find that it is as constructive as it is destructive, and at the same time tends towards the well known practice of "muckracking" everybody except the association rendering the report. No one would object to this body actually spending a few dollars to develop new kinds of insulation which would produce a smaller diameter conductor—it is a very desirable thing to have conductors as small as possible—but at the same time safety should not be sacrificed either in regard to fire or to life.

I desire to make it clear that the general wiring which is placed in the buildings of Europe is so poor that it could not be defended by a committee even as radical as the one making this report. It consists of all manner of cord attached to fittings of all designs and manufacture without any standard as to spacing, methods of insulation, etc. As a matter of fact, European practice is not to furnish as much illumination as is the practice in this country and many times poor illumination is due to the use of cords and conductors which become overloaded due to the distance from the center of distribution and the number of lamps on a conductor.

Comparisons

We should be very careful in drawing comparisons between Europe and the United States. This applies to people, customs, habits and all methods of life and it is not fair to either country to make comparisons as they are so different. This is also true when we compare wiring practices. We should not forget that the basic construction in Europe is much more fire resistive than in the United States, consequently cheaper methods of wiring do not inherently produce the hazard they would in this country. Also Europeans are occupying these fire resistive buildings, which have been in use in many cases since the tenth century, and are still being used, and methods which are applicable to these structures should not be copied in a new and progressive country such as the United States. Also the economic status is entirely different and many times, even the installation of cord wiring is more of an economic hardship on these people than the most expensive conduit wiring in the United States. For instance, the magnificent Cathedral at Milan, which took six or seven centuries to construct, of course, had no provisions made in it for electrical wiring, consequently today there are a great many feet of flexible cord in use in this structure, but I doubt whether even our friends who wrote this report would recommend that the new cathedral being constructed at the present time in Washington, D. C., should follow these methods in regard to electrical construction.

This report states the following: "To some extent we have been guided by European practice. The design of some of the material in common use over there—often at double our voltage—can be modified to suit our conditions. Some of the accompanying illustrations show the type of construction encountered in the use of lead cable assembly made in England." This report does not state that the lead covered assembly made in England was made for the purpose and use that has been suggested in this report. It is not necessary for us to go to England to find similar products, for American practice long ago forgot all about placing conductors in the grooves of floors.

Furthermore, the writers of this report surely have a peculiar idea of a wiring system when they state it is made up of the following elements: "a—Electrical conductors, b—Outlet boxes, c—Switch mechanism, receptacles or sockets placed in the box at the termination of the conductor." They apparently are not interested in the service or protection of the circuits and many other details.

European Wiring

Again it is stated "The basic idea is ample as it is proved by general use in Europe for 230 volts." I also desire to say that this statement is not borne out by facts, and it is more the exception than the rule that this class of wiring is used in continental Europe.

I note with interest also that the report will not endorse the so-called "sheath wiring system" and I am wondering if the future reports will be just as willing to get under cover and not endorse the suggestions of this report, as this one is to discredit previous efforts of other associations along this line.

Many references have been made in

(Continued on page 38)

Tentative Rules on Metallic Tubing

TENTATIVE National Electrical Code rules to govern the installation of "thin wall conduit," or metallic tubing, as drawn up by Article 5 Committee have been released in order that those interested might be able to make their comments either orally or written to the committee at an open hearing on January 17. This hearing is set for 10 a. m. at 109 Leonard Street, New York City.

The submittor of the material, The Elyria Iron and Steel Company, has complied with the new regulations preliminary to a consideration of a new product by an article committee. It has notified the Article 5 Committee that it will accept its report tentatively as a basis for discussion, although the provisions of the report are not satisfactory to it. In the meantime the company is distributing in pamphlet form "Thin Wall Conduit Presents its Case," copies of which may be obtained from the company at 224 East 131st St., Cleveland, Ohio.

The material in question, to quote from the manufacturer's booklet, "consists of ½-in., ¾-in. and 1-in. rigid conduit with outside diameters corresponding to the outside diameters of the present standard conduit, viz: 0.840, 1.050 and 1.315 in., respectively.

The wall thickness of the several sizes is shown in the following table, together with the wall thickness of the present standard conduit.

The outside surface of the conduit is electro-galvanized and the inside surface has an enamel finish.

Size of Conduit In.	Thickness of Steel B.W.Gauge	Wall Thickness—In.	
		Light Gauge	Standard
½	19	0.042	0.109
¾	18	0.049	0.113
1	17	0.058	0.133

Proposed Rules For Article 5, Section 515, National Electrical Code

515—Metallic Tubing

a. Except where and as permitted by Section 520, in under plaster extensions, metallic tubing shall be used only in exposed dry locations, and no metallic tube having less cross-sectional area than a nominal ⅜ in. size shall be used. Metallic tubing shall not be used where the difference of potential between the wires therein exceeds 300 volts, nor where any wire exceeds 150 volts to ground. The metallic tubing shall not be used in high temperature, hazardous or extra-hazardous locations. It shall not be placed in elevator shafts.

b. Metallic tubing and the fittings for use therewith shall be of approved type and in no instance shall the inside cross-sectional area of the tube exceed that of a 1 in. conduit. All surfaces of the tubing, elbows, bends and similar fittings shall be suitably protected against corrosion.

c. Metallic tubing shall have an interior and exterior coating and a non-round cross-section of a character and appearance which will readily distinguish it from ordinary tubing commonly used for other than electrical purposes, and from conduit, and which will prevent its misuse with fittings intended for use with other electrical materials. In no instance shall the ends of any length of metallic tubing be threaded.

d. Metallic tubing and its elbows, couplings and similar fittings shall be so designed that the sections can be electrically and mechanically coupled together. All boxes and other fittings shall be so designed as to protect the enclosed wire from abrasion at the point where a metallic tube enters a box or other fitting.

e. Elbows or bends shall be so made that the tubing will not be injured. The radius of the curve of the inner edge of any elbow shall not be less than five times the length of the oval.

f. Metallic tubing shall be installed as a complete system without wires. It shall be continuous from approved fitting to approved fitting. The entire system shall be securely fastened in place. Metallic tubing may be extended through walls or partitions if in unbroken length where passing through. It shall not be used within 4 ft. of the floor in other than dwellings and offices unless protected from mechanical injury by an iron pipe sleeve placed over the tubing.

g. Metallic tubing shall be grounded as prescribed in Article 9 of this Code, and at a point as near as practicable to the source of supply; provided, however, that this requirement shall not apply to isolated runs not exceeding 25 ft. when these runs are free from metallic contact with the ground and from adjacent grounded metal and are guarded when within reach from grounded surface.

h. Wires shall be approved rubber-covered type (R) and shall be continuous from outlet to outlet, or from fitting to fitting, no joints or taps being located in the tubing proper.

i. Wires of different systems shall not occupy the same tube.

j. Where alternating current is to be employed in metallic tubing work the conductors shall be so grounded within one tubing that the current in one direction shall be substantially equal to the current in the opposite direction.

(Fine print note).

(It is recommended that this course be pursued in the case of direct current also, in order to obviate inducting troubles if a change is made to alternating current later.)

k. Except by special permission of the inspection department one metallic tube shall not contain more wires than as specified in Table 1 of this section. The tubing shall in no instance contain any wire larger than No. 8 B & S. Gauge.

l. No tubing shall contain wires whose combined cross-sectional area exceeds 60 percent of the internal cross-sectional area of the tube. Except for short lengths not exceeding 20 ft. and having not more than the equivalent of two ¼ bends, not including any bends at outlets, tubing shall not contain wires whose combined cross-sectional area exceeds 40 per cent of the internal cross-sectional area of the tubing. The following tables give some of the usual combinations of conductors allowable in various given sizes of tubing. The sizes indicated in the tables are the internal diameters of round section conduits, having cross-sectional areas the same as those of corresponding nominal sizes of metallic tubing.

TABLE 1—TWO-WIRE AND THREE-WIRE SYSTEMS

Size of Wires	No. of Wires in One-Metallic Tube.								
	1	2	3	4	5	6	7	8	9
	Minimum Size of Tubing (I. D.)*								
14	⅜	⅜	½	¾	¾	1	1	1	1
12	½	½	¾	¾	¾	1	1	1	
10	½	¾	¾	1	1	1			
8	½	¾	1	1	1				

*Corresponding to nominal rigid conduit sizes.

Where single conductors, single braid, solid wires only are used, four No. 14 wires may be installed in a ½-in. metallic tube, and up to seven No. 14 wires in a ¾-in. Three No. 12 wires may be installed in a ½-in. metallic tube, four No. 10 wires in a ¾-in. metallic tube, and three No. 8 wires in a ¾-in. metallic tube.

TABLE 2—THREE CONDUCTOR CONVERTIBLE SYSTEM

Size of Wires	Size of Metallic Tubing I.D.
Two No. 14 and one No. 10	¾-in.
Two No. 12 and one No. 8	¾-in.
Two No. 10 and one No. 8	1-in.

m. Wires in vertical runs exceeding 100 ft. shall be supported by one of the methods indicated in Section 503-n.

This conduit is designed to be used either with the present approved threadless fittings or with other threadless fittings which may be approved for this purpose by the Underwriters' Laboratories.

Article 5 Committee has had presented to it the tests made by Underwriters' Laboratories and the report of a technical sub-committee. With these to guide it Article 5 Committee has prepared tentative rules. Commenting on the rules Article 5 Committee reported as follows:

The Committee on Article 5 reports herewith on a type of wiring to be known as metallic tubing.

The Technical Sub-Committee appointed to investigate this material submitted a very well arranged and complete report, and after carefully considering this report the Article 5 Committee submits as follows an amended report:

1. The so-called "light gauge conduit" should be recognized in the National Electrical Code.

2. On account of actual differences in mechanical strength and ruggedness it must not be recognized as rigid conduit without material changes in the rules governing rigid conduit.

Not a Metal Raceway

3. On account of the different protection it provides for conductors it cannot be recognized as a form of metal raceway without very extensive changes in the rules governing raceways for surface wiring.

4. It is essential that it be different in appearance from the rigid conduit now recognized as standard and improper connections be prevented by a non-round cross-section, preferably somewhat oval.

5. For reasons of expediency, apart from the possible maximum capabilities of the material, it should be limited to use with No. 8 wire and circuits not exceeding 300 volts between wires, nor over 150 volts to ground and to a maximum size of a cross-sectional area equivalent to 1 in. diameter conduit.

6. In consideration of its electrical properties it should be allowed the same wire capacities for equivalent inside cross-sectional area as now allowed for rigid conduit.

7. Threadless fittings of approved type can be made available for use with this material.

We recommend as follows:

a. That the material be recognized as a distinct wiring method and be called "Metallic Tubing," and that suitable rules under Article 5 be drawn for it.

b. That the rules be based generally upon 504—"Raceways for Surface Wiring," with the inapplicable parts omitted in view of the different protection afforded by this material and that applicable parts of 503—"Conduit Work" be included.

The committee has provided for compliance with these recommendations by drafting suggested rules.

European Wiring Practice

(Continued from page 36)

the report "to obtaining material from the five and ten cent stores." By regulating the sale of materials by city ordinances and allowing only those materials which have shown by test to comply with the requirements of Underwriters' Laboratories to be sold, all this material can be made standard, owners can be required to take out permits for work and do the work under competent inspection. Then all this practice can be eliminated. If our friends writing this report would take a trip to Europe they would think the only supply houses were five and ten cent stores without regulation.

It is not to be understood from what I have stated above that there are not good methods of wiring employed in Europe, but I want to repeat that the general wiring in Europe is inferior to the wiring installations in the United States. We should not pick up some European materials and try to transplant them and not follow the practice that they are used for in the country in which they were found.

In order to be really European, I would suggest to the committee that they adopt the practice used in Paris of outlining buildings in open gas jets instead of electric lights. I had the pleasure of looking at a great many thousands of these during the Bastile celebration this year.

Hazards in London

In London I was very much interested in the report made by a coroner's jury when a gardener was electrocuted by coming in contact with a circuit which had been wrapped around a hedge. One of the prominent London daily papers devoted quite a lot of space to the cause of this gardener's death and the prevention of future accidents. The coroner's jury after hearing all of the evidence and viewing the wiring system, etc., brought in the following verdict: "John Washburn met his death by misadventure." Maybe our friends who compiled the above report will suggest the adoption of this kind of verdict whenever a person is electrocuted in the United States. Of course, the use of this wording would absolutely disabuse the minds of the public that electricity had anything to do with the death of the victim.

It is deplorable that a report of this character should especially emphasize cheaper and lower costs for all wiring methods and at the same time assume the self-appointed and grave responsibility of representing the "Great Unorganized Consumers," without one thought as to the safety of their protege. Wouldn't it be better business and a more sane policy to talk protection and safety and at the same time help towards designing the installations so as to give complete satisfaction to the Dear Unorganized Consumer, thereby fostering a desire on the part of the house owner to use more kilowatts.

Facts Wanted

If we are so benighted in the United States, why not send an impartial fact finding committee to Europe to study their methods of wiring and make a comprehensive engineering report on their practices, stating whether or not they are adaptable to American conditions. Then if this commission finds, after due consideration, that the European methods are superior to those in vogue in the United States and accomplish superior results for the power companies, manufacturers, contractors, and at the same time properly protect the "Great Unorganized Consumer," then it would be time to spend money on redesigning all our materials and devices and also the revision of our rules and regulations. This report should be very carefully considered and the cost of European practice should not be a guide to American practices because of the difference in economic conditions and our desire to have everyone enjoy a higher plane of living than at present enjoyed in the countries of Europe. Also, it should be borne in mind that a report of this character will take some money, much time and patience to compile and snap judgments should, above all else, be avoided.

A mechanic's lien is sometimes useful in collecting your money, but the preparation of the notice is very important because an imperfect notice may make the lien invalid.

Rules for Perfecting Mechanic's Lien

By LEO T. PARKER
Attorney at Law, Cincinnati, Ohio

SO MUCH litigation has resulted over the sending by contractors and subcontractors of imperfect notices of liens, that a complete understanding of this subject is highly important. The general rule of the law is that notices of this nature must comply at least nearly, if not strictly, with the statutes. The preparation of the notice of a lien is equally as important as the enforcement proceedings.

For example, in the case of Forman v Kelly, 139 S. E. 708, decided during the past few weeks, a subcontractor was held not entitled to a valid lien for labor and material, simply because the notice sent to the owner of the property was insufficient.

Lien Held Imperfect

The facts of the case are that a subcontractor entered into a subcontract with the contractor to perform certain work. When payment for the labor and material was uncollectable from the usual source, the subcontractor served notice on the owner of the property intending to establish his lien, but the nature of the subcontract was not explained in the notice except to state that he was a subcontractor for the furnishing of material and doing of the work and labor necessary to the completion of a certain building (describing it and the land on which it was located) and that the contract price and value of the work and material was $446.25. The Court held the lien imperfect, and explained the law on the subject as follows:

"Liens of mechanics and materialmen are purely statutory, and it is quite generally held they must show upon their face all the statutory requisites to their validity. The procedure for perfecting and preserving the lien is in the hands of the mechanic or materialmen. The landowner has no control over the procedure. The statute entitles the latter to full information, so that he can protect his property from sale. We are not concerned with the reasons which actuated the Legislature in requiring the subcontractor to state the nature of the subcontract in his notice; for, in order to perfect and preserve his lien and get the benefit of the statute, he must substantially comply with its terms and requirements. There has not been a substantial compliance with the statute, and the notice is ineffective to perfect and preserve the lien because it does not in any way attempt to state the nature of the subcontract."

To Make a Lien Legal:

1—The nature of the contract must be explained in the notice.

2—The price of the job must be given in the notice.

3—The materials must be itemized in the notice.

4—Notice must not be delayed.

5—Notice must be signed by authorized officer or agent.

6—Notice must be served on owner or his legal agent.

Notice Must Include Price

In McVey v Kaufmann, 72 Atl. 503, a subcontractor's mechanic's lien was held invalid because the price for which he agreed to perform the work for the general contractor was not included in the notice sent to the owner of the property. This Court stated the law, as follows:

"Though notice of an intention to file a lien must be given by a subcontractor to the owner of the building before a valid lien can be filed, the notice forms no part of it. All that need appear on the face of the lien is when and how notice was given. Not even the contract price for what had been furnished was given. From all that the owners could have learned from the notice as to the contract between their contractor and the subcontractor the reference to it might as well have been omitted altogether. The evident purpose of the requirements that a subcontractor must set forth in his notice to the owner of the building the contract under which he claims is to enable the owner to know just what the rights of the claimant are, and to protect himself accordingly."

Also, in Niswander v Black, 40 S. E. 431, it was disclosed that a subcontractor filed a notice of a lien for $885, in which was included an itemized account of the material he had furnished. However, one item in the account was listed as: "Estimate furnished, $485." On account of this indefinite statement, the notice was held invalid, and the Court said:

"The main question involved in this case is the sufficiency of the mechanic's lien and especially as to the item in the account filed, 'Estimate furnished, $485'. There is nothing in or about the item, 'Estimate furnished, $485', from which any one could infer what it included or what it meant. Estimate of what?"

On the other hand, in Chandler Lumber Co., v Fehlau, 117 N. W. 1057, where the particular kind of material was listed, but not itemized piecemeal, as: "Material furnished—lumber and millwork to the value of eleven hundred dollars", the Court held the lien valid and stated:

"The object of the notice, required by our statute to be given by the subcontractor, is to enable the owner to protect himself by withholding the amount claimed from the principal contractor. While we think the statement of materials furnished is meager and not to be commended, we cannot say that it is not a compliance with the statute requiring a statement of the materials furnished. The purposes of this statement are twofold: First, to secure payment to persons who furnish material or perform labor upon the structures therein mentioned; and, second, to apprise the owner that a claim therefor is made for the amount due for such labor or material."

Form of Notice

The form of the notice and its service on the owner must be strictly in accordance with the law. For instance, in the case of DeSoto National Bank v Arcadia Electric Light, Ice and Telephone Co., 52 So. 612, it was disclosed that a contractor who had performed labor and furnished light fixtures, intending to perfect his lien, sent the owner of the property the following notice:

"Dear Sirs: This is to notify you that under our contract for electric light and annunciator in your new building, amounting to $490, and extras as approved, $100, making in all, for wiring

(Continued on page 41)

Chats on the National Electrical Code

A Monthly Discussion of Wiring Practice and Questions of Interpretation, Presented with a View Toward Encouraging a Better Understanding of the Industry's Most Important Set of Rules

Conducted by F. N. M. SQUIRES
Assistant Chief Inspector, N. Y. Board of Fire Underwriters

Lead Covered Wires in Conduit Out of Doors

Some inspection departments are still endeavoring to require the use of lead covered wire in conduit work where used out of doors, underground or in other damp locations.

Rule 503-i deals with the requirements for conduit wire. If the lead covering was required, it would be mentioned in this section.

There is no doubt but that its use is good engineering and that it would be used on a little better than the average job. That, however, is different than a Code requirement.

Rule 501-g, while dealing with open wiring, gives a little further insight into this subject as there it says: "Wires located in damp places or in buildings *especially subject to moisture* shall be of the rubber covered type." This is another way of saying the 1920 (26-i) Code ruling: "For protection against water, rubber insulation must be used." If, then, lead covering was to be used as a protection against moisture or water, would it not have been also required in the last mentioned places?

The point is, that the Code now permits the use of rubber covered wire in conduit in damp locations or underground (with the exception of service wires).

Socket Linings

Considerable trouble has been experienced with the insulating linings of brass-shell sockets when used with gas filled lamps in places where adequate ventilation is not secured, such as show windows.

The sockets have become so hot that the fibre or paper lining has carbonized and shorted between the live parts and the grounded shell. This, of course, happened more readily on the old non-polarized work than does now where the system is polarized. Also, in many instances the damage would have been lessened if the fuses had been maintained at the proper value.

But the Code (1404-b) requires that the inside of metal shells be lined with insulating material and as carbonized paper or fibre is not insulating, sockets used in locations where high temperatures are experienced, while meeting with Code requirements at the time of installation, do not always do so after a short time in use.

As show windows in general are very poorly ventilated and almost universally quite hot, it would be well to give some thought to the matter and possibly it might be better to use porcelain sockets and also heat resisting insulation on the conductors.

Insulation

A sledge hammer delivers a blow of greater force than the tack hammer, and takes more energy to drive it to the mark. This simple fact everybody understands, but in electrical engineering we are continually using a sledge hammer to deliver a small amount of energy, and tearing things to pieces in this wild slinging of the hammer. Engineers of the fire pump division of the National Fire Protection Association advocate the use of low voltage motors for fire pump service, because they feel that the insulation of the motors and other equipment should not be subjected to the continuous blows delivered by high voltage stresses. This simple argument in favor of low voltage equipment in extra-hazardous places is not clearly recognized by the trade, but as an insurance inspection department, we are continually trying to drive the principle home. When insulation is torn apart and a short circuit results, the arc produced by the short circuit will surely ignite explosive vapors, dust and lint if present in sufficient quantity in the vicinity of the motor, switches, control apparatus or conductors. Low voltage equipment not being subject to sledge hammer blows, will last much longer than insulation which is under such stresses. We mention this because at the meeting of the Western Section of the International Association of Electrical Inspectors at Toronto, a voltage as high as 2,300 was mentioned as satisfactory for equipment in extra-hazardous locations. To this we strenuously object, and think that 440 volts alternating current should be the maximum for electrical apparatus located in hazardous or extra-hazardous locations.

—George Welman.

In Reference to Questionnaires

There are at present a few questionnaires out among the members of the electrical fraternity sent from various sources. Generally, only a small percentage of these are returned answered. One of the reasons for this is that the importance of the answers is not realized by those receiving them.

But their importance is great! This fact cannot be stressed too much, especially in regard to those out at the present time. By the answers received from widely scattered territory and from persons in the various branches of the electrical industry can be recognized the need for action along various lines. Means may be found to eliminate abuses; new devices to promote safety may be provided for; unnecessary Code rulings eliminated and new ones promulgated to bring the Code up to date.

Please, everybody, answer the questionnaires!

Belated Credit

In the December Code Chats the name of R. H. Manahan was omitted as the sponsor for the article on "Grounding Service Conduit." We regret this omission as, with the Literary Digest, we believe in "credit where the credit is due."

Conduit Construction

A steel conduit, cable or raceway job should be effectually grounded so as to prevent a rise of potential on the raceway or conduit system. To prevent an appreciable rise in potential, the resistance in the path to the ground should be as low as possible.

In practical construction, electricians usually make no effort to remove the paint from boxes and cabinets, except such as is scraped off when tightening the locknut and bushing. Tests show that this answers the purpose and that there is little resistance at such connections. We have seen instances where large currents caused heating at locknuts on ½-in. conduit, but such instances are rare. When screwed type fittings such as sleeves and tapped cast metal boxes are used, the wiremen seldom, if ever, run a "straight" tap into the threads to remove the paint; they usually run the dies over the conduit. In tightening up the conduit a wrench should be used; at times we have seen much work installed without wrenches. The excuse for this was that the line would be tightened up later on. Our fire reports show cases where loose couplings brought about arcing or heating.

Inspection departments find it quite a problem to instruct wiremen and contractors in the conductivity principle of conduit construction. A mechanic should be careful in setting his dies so as not to cut too deep a thread and depend upon the paint on the coupling to make a tight fit. Will the male conduit thread remove the paint? Screwing the conduit into the sleeve may not thoroughly remove the paint; a "straight" tap is necessary for this work, but has any inspector discovered a set of pipe taps on a job of electrical construction?

Conduit and raceway construction should be very carefully installed to make a safe raceway system, but the average wireman apparently knows or cares very little about the conductivity of the system. The average contractor seems to be about as disinterested as the wireman. The main idea with contractors and wiremen is to make a job of neat appearance and as far as inspection departments are concerned, appearance is the least essential part of the work. Inspection departments are interested in the conduit system being electrically connected together at all fittings and couplings, so that arcing and heating will not occur in the event of insulation failure on the undergrounded conductors within the conduit.

We are next interested in the upkeep of the conduit in places where it is subject to corrosion or mechanical injury. Where conduit is installed in damp places it corrodes in a short time and needs replacing; and where it may be conveniently used to hold pulleys for hauling hay into a loft, it may be pulled apart at couplings and fittings; (last week we saw such a condition in a stable).

Next we are interested in the insulation of the conductors within the conduit and in the splices. We are especially interested in having junction and pull boxes of sufficient size, so that the insulation will not be torn to pieces when the conductors are pulled in. Small junction boxes, in which conductors at splices are forced into the box with a sledge hammer, are especially objectionable. Rubber insulation is elastic. It will stand a lot of punishment, but it does not help the effectiveness of the insulation to make a short bend in the wire around a bushing in a cabinet or in a junction box. The strain on the insulation of large conductors may be considerable at such bends, and the insulation may eventually break down.

Then as a whole, there are many defective features that may be looked for within the walls of a conduit system and to make the conduit system safe, the wireman should be very careful when installing both conduit and conductors.

—Geo. Welman.

[EDITOR'S NOTE: There has recently come to hand a sample of an "acid proof" conduit. Its trade name is derived from its color scheme and the literature sent with it claims that the outer coating, which appears to be an enamel, is not only acid proof but is also conductive, which, of course, makes it unnecessary to remove this coating to be able to get a proper electrical connection with a ground clamp.

Just what results will be obtained from this type of conduit will be very interesting as something of this sort is greatly needed in laundries, dye works and many other places employing strong chemicals.

We will be glad to hear of any field experience from our readers.]

Rules for Perfecting Mechanic's Lien

(Continued from page 39)

to outlets, $590, $300 has been paid, and we are looking to you to protect the remainder of the contract price."

Letter Insufficient

The Court held the notice ineffective, and said:

"The statutes require the service of 'a written notice that the contractor or other persons for whom the labor has been performed or the materials furnished is indebted to' the complainant. This notice is not of that character. Where a statutory lien is allowed upon compliance with stated requirements, there should be a substantial performance of all the requisites, and a failure in this results in no lien."

In another recent case (180 Ill. App. 578), it was held that where the form of the notice did not state that the subcontractor was employed by the general contractor, the lien was unenforceable. Moreover, failure or delay in giving the notice renders the lien invalid (156 S. W. 896).

Who May Sign

Generally, any partner of a partnership, or an authorized officer or agent of a corporation may sign the notice filed to perfect a lien. For instance, in Harrison Construction Co. v Greystone Hotel Co., 127 S. E. 641, it was shown that the superintendent, who was not an officer of the company, signed the following affidavit of the notice:

"L. B. Perrin, being first duly sworn, upon his oath says that the statements contained in the foregoing notice of lien are true, as he verily believes."

The Court held the lien valid, and explained the established law on the subject, as follows:

"Construction work is usually, if not invariably, begun with confidence in the owner's ability to pay. As long as that confidence exists, a statutory lien is seldom perfected. The superintendent is the officer most likely to know the desirability or the necessity of taking the lien permitted by the statute. It is his duty to act promptly in case of emergency to safeguard, as far as may be, the interests of his employer. When an affidavit is required of a corporation and no particular officer is designated in the statute to make it, it may be made by any one of its officers or agents."

Notice to any one of the persons of a partnership is binding and legal (168 Ill. App. 85). But if the owner of the building on which the lien attaches has no partner, the notice must be served on the owner or his legalized agent. (180 Ill. App. 85).

The Electragist

Official Journal of the
Association of Electragists—International
S. B. WILLIAMS
Editor

Forecast

In the first issue of each year editors as a rule present forecasts or opinions of industry leaders relative to the probable trend of business during the year. We have done that in the past, but all that we could hope to forecast was a general picture of new building conditions.

If we take the opinions of leaders in the business world, the new year will, if anything, be better than 1927. Some of this, however, is undoubtedly based on hope. This is the year that we select a new president. That, of course, ought to make no real difference to the business world, but for the past few years the stock market has been rather steadily climbing and is now inclined to be somewhat panicky.

The new year ought, on the basis of the financial condition of the country, to be good. Money is still plentiful and cheap. Last year and the year before we poured our surplus into Germany and South America. It is doubtful if we will be able to do so to the same extent in 1928.

A growing surplus of cash is bound to result in measures to employ it. This means machinery, construction and trade.

However, it is the translation of this into business for our readers that we are concerned with. The electrical construction work will on the whole probably be as good or better in 1928 than 1927; but not necessarily for each individual contractor.

In other words, the sum total will be more, but it will be spotty and as a result there will be more worried contractors.

And this is too bad, because there is no necessity for it. It reminds us of the skipper of a vessel that had drifted into the Amazon River and finding his water casks empty sent out a call for water. The reply was, "Lower your buckets. You are in fresh water."

The contractor is in the midst of plenty but does not know it. The man who is having the hardest time is the small fellow who has been depending on new house work. New house construction has fallen off and there are no signs of its probable recovery in 1928, but there is the bigger untapped market of rewiring, of reinspection that should prove to be a gold mine.

Inspect the premises of every factory, store, office building and home you can. In at least half of them a good man can find things to correct—and if he is a real good man he will find other things to add.

Of course, if a contractor is willing to accept general conditions and make no effort to improve his situation, he is probably going to have tough sledding in 1928.

On the other hand, we predict an excellent year for the contractor who isn't going to be satisfied to have jobs hunt for him but who goes out hunting jobs and making business. That contractor can make 1928 anything he wants it to be.

Deserved Tribute

Many men do their work so well that they command the confidence and respect of those they work with, but there is a smaller number who receive affection besides. Last month the electrical people of our two largest cities gave public expression of the affection they hold for two such men—Victor Tousley, head of the Chicago municipal inspection department, and Joseph Forsyth, chief of the New York Underwriters' electrical department.

These men have done a good job. Theirs' has been no easy task. Charged with protecting the public against the hazards of improper electrical installation they might easily have become arbitrary and hard-boiled. They have chosen, however, to work with their hearts as well as with their heads—and they richly deserve all of the esteem, affection and honor that has been bestowed upon them.

Outlet Layout

How many convenience outlets should there be in a room? We have heard this question debated a number of times recently.

Some people hold to one outlet for every so many feet of wall space. When standards, however, are made on such a basis workmen frequently interpret the rule literally and put in an outlet every so many feet. As a result outlets are found behind radiators and doors and in many other wrong places.

Other people seeing this difficulty have gone to the floor area basis. This is open to the objection that rooms may not be so arranged as to accommodate the required number of outlets.

Of course both of these methods are good guides—it is when they are made mandatory, in order to come up to a standard, that trouble arises.

There is only one answer to the question—how many outlets should a room have?—Enough!

Labor Agreements

While the electrical construction industry has been free from labor disturbances for years the local agreements have not always been reached without bitter discussion.

The unions do not like to have labor regarded as a commodity and yet the employers cannot lose sight of the fact that labor is a definite part of the cost of installation, the price for which (rate per hour) is regulated by agreement.

When buyers and sellers meet to discuss the terms governing the purchase of a commodity for the next year, there is no petty bickering or bitterness. There is a meeting of minds and a mutual agreement is reached when both sides are satisfied they have achieved all they can.

Why should the discussion of a labor agreement be any different? Labor will always want to improve its financial situation. There is nothing unreasonable about that. When the demands of labor are made known the employers will, as a rule, offer something less. And there is nothing unreasonable about that.

It simply means that two limits have been set up between which an agreement must be reached. If this agreement can be obtained by cool, level headed discussion it will leave a better feeling on both sides.

It is unfortunate sometimes that an employer member of the conference stands to lose considerable money personally by any advance. To him such a demand is very personal and in self-protection he fights.

Labor is always on the offensive, having an objective to reach. The employers are always on the defensive, seeking to save as much as possible. It requires more tact to play the defensive role successfully. For that reason employers can well afford to take a leaf from the book of labor and employ men skilled in argumentation to handle their case.

Employing contractors are too frequently ill equipped to argue with trained union leaders. Eventually an agreement is reached, but if reached with bitterness it leaves a smoldering fire that is bound to break out sooner or later. And worse than that, it may bring soldiering on the job.

Labor agreements amicably reached are best for both sides.

Personal Glory

Sometimes a man gets interested in association work and, because of his willingness to work, soon finds himself the hub around which the wheel is revolving. It is inevitable that honors will come to that man, that magazines will recognize his usefulness and say so, that he will be quoted—in other words, he will receive a large amount of personal publicity.

And then the fun begins. Almost invariably some member, with envy in his soul, will start the gossip that "so-and-so is getting bigger than the association and all he is after is the publicity."

The honors, publicity, etc., are an exceptionally poor return for the time, effort and money that a fellow puts into association work. And then the criticism, the petty jealousies, the envy—these are some of the reasons why more men of ability do not dig deep in association work. It takes a big minded man to go on trying in the face of such discouragements.

When a willing and capable man is found give him encouragement. Strong associations are built around such men and as a rule the moment such men begin to lose interest, the associations they have built up begin to droop.

Don't be petty, don't be mean, the honors such men receive are small compensations for the work they do.

The Meanest Cut of All

When somebody is selling a prospect a real job of lighting and wiring and is making progress, what is worse than to have some half-baked contractor tell the prospect that he doesn't need all that work—that he can get along with less and that the other fellow is merely trying to load him up? Of all the price cutting, job cutting practices that is the meanest cut of all.

It is such tactics on the part of certain contractors that give the whole contracting industry a black eye. If there is to be competition let it be on the basis of a better job. There is a profit in a better job. The man who sells a better job is the man whose business is bound to grow. The man who cuts the job never grows. He stays small because he has a small mind and has a small way of doing things.

Circuit Protection

The little plug fuse has for a long time been a most faithful servant. It has a time element and will not blow on any momentary rush of current if within reasonable limits. It can be depended upon to open the circuit under a continued overload and under the most severe short circuit conditions met in practice the circuit is opened safely.

But the plug fuse has one shortcoming for which it can hardly be blamed—it is unable to protect itself against abuse, and its abuse is so common that there is no certainty that a circuit presumably protected by a plug fuse really has any protection at all. It is not uncommon to find fuses that have been bridged or back up with pennies.

Some investigators believe that the nearest approach to unbeatable branch circuit protection can be secured by using a small circuit-breaker with its moving parts enclosed in a riveted-on metal cover. The magnetic type will open the circuit under a short circuit but kicks out too readily under a momentary current rush. A thermal type has been developed which has the necessary time lag but the thermostat strip burns upon short circuit before the breaker can open. A combination of the two types, with thermal operation for ordinary overloads and auxiliary magnetic operation in case of a short circuit is really necessary. Such a device, built into a dead front panelboard, could be depended upon as a permanent protection unless actually shunted by changing the connections, and this could be made a somewhat difficult and time-consuming job.

Association of Electragists
INTERNATIONAL

PRESIDENT, Clyde L. Chamblin
687 Mission St., San Francisco, Cal.

SECRETARY AND TREASURER, Laurence W. Davis
15 West 37th Street, New York City

EXECUTIVE COMMITTEEMEN

Eastern Division
A. C. Brueckmann,
314 Keyser Bldg.,
Baltimore, Md.

Southern Division
J. A. Fowler,
118 Monroe Avenue,
Memphis, Tenn.

Southeastern Division
Charles E. James,
Lektrik Shop, Inc.,
Fort Pierce, Fla.

Great Lakes Division
L. E. Mayer,
14 No. Franklin Street,
Chicago, Ill.

Central Division
A. Penn Denton,
512 South West Blvd.,
Kansas City, Mo.

Pacific Division
C. L. Chamblin,
687 Mission Street,
San Francisco, Calif.

Mountain Division
E. C. Headrick,
87 Broadway
Denver, Colorado

Eastern Canadian Division
R. A. L. Gray,
85 York Street
Toronto, Ont.

Western Canadian Division
J. H. Schumacher,
187 Portage Avenue,
Winnipeg, Man.

Open Shop Section
S. J. Stewart
527 St. Joseph St.,
New Orleans, La.

Union Shop Section
W. Creighton Peet,
70 East 45th St.,
New York City

At Large
G. E. Shepherd,
11 West Market Street,
Wilkes-Barre, Pa.

COMMITTEE CHAIRMEN

Architects and Engineers
L. E. Mayer,
14 No. Franklin St., Chicago, Ill.

Code
A. Penn Denton,
512 So. W. Blvd., Kansas City, Mo.

Conventions and Meetings
C. L. Chamblin,
687 Mission St., San Francisco, Calif.

Cost Data
J. H. Schumacher,
187 Portage Ave., Winnipeg, Man.

Credit and Accounting
J. F. Buchanan,
1904 Sansom St., Philadelphia, Pa.

Electragists' Data Book
J. H. Schumacher,
187 Portage Ave., Winnipeg, Man.

Legislation
G. E. Shepherd
11 W. Market St., Wilkes-Barre, Pa.

International Relations
R. A. L. Gray,
85 York St., Toronto, Canada

Liability Insurance
Joseph A. Fowler,
118 Monroe Ave., Memphis, Tenn.

Membership
A. C. Brueckman,
314 Keyser Bldg., Baltimore, Md.

Publication
L. K. Comstock,
21 East 40th St., New York City

Radio
E. C. Headrick,
87 Broadway, Denver, Colo.

Red Seal
C. L. Chamblin
687 Mission St., San Francisco, Cal.

Standardization
L. E. Mayer,
14 No. Franklin St., Chicago, Ill.

Trade Policy
W. Creighton Peet,
70 E. 45th St., New York City

Wiring Methods
G. E. Shepherd,
11 W. Market St., Wilkes-Barre, Pa.

Past Presidents of the National Electrical Contractors' Association

Charles L. Eidlitz 1901-1903
E. McCleary 1903-1905
James R. Strong 1905-1908
Gerry M. Sanborn 1908-1910
*Marshall L. Barnes 1910-1912
Ernest Freeman 1912-1914
John R. Galloway 1914-1916
*Deceased
Robley S. Stearnes 1916-1918
W. Creighton Peet 1918-1920
James R. Strong 1920-1925
Joseph A. Fowler 1925-1927

PRESIDENTS AND SECRETARIES OF STATE ORGANIZATIONS

State	President	Secretary
British Columbia:	C. H. E. Williams, 509 Richards St., Vancouver	J. C. Reston, 579 Howe St. Vancouver
Alabama:	J. R. Wilcox, 2017 First Ave., Birmingham	D. B. Clayton, Am. Trust Bldg., Birmingham
Arkansas:	Ed. Appler, 901 Central Ave., Hot Springs	Clem. Dresse, 316 Louisiana St., Little Rock
California:	H. H. Walker, 1323 Venice Blvd., Los Angeles	C. J. Geisbush, 610 Cotton Exchange Bldg., Los Angeles
Colorado-Wyoming:	Matt Whitney, Colorado Springs	P. Harry Byrne 965 Madison St., Denver
Florida:	W. S. Monroe, 308 Cass St., Tampa	Charles E. James, Fort Pierce, Fla.
Illinois:	Edgar Rice, 207 East Broadway, Alton	John Kuhlemeyer 1317 S. Sixth Ave., Maywood
Indiana:	G. T. Howard, Althoff-Howard Elec. Co. Evansville	Frank Argast, Hatfield Elec. Co. Indianapolis
Iowa:	Earl N. Peak, 1603 W. Main St., Marshalltown	J. R. Payton, 13th & Walnut Sts. Des Moines
Kansas:	L. M. Atkinson, 116 E. First St., Pittsburgh	Harry Hagler Salina
Louisiana:	Robley S. Stearnes, 628 Carondelet St., New Orleans	I. G. Marks, 323 Chartres Street, New Orleans
Maryland:	A. C. Brueckmann, Keyser Bldg., Baltimore	W. D. Young, Calvert and Franklin Sts., Baltimore
Michigan:	W. F. Fowler, c-o Barker-Fowler Electric Co., Lansing	E. P. Blackman, c-o Motor Shop, Battle Creek
Missouri:	Charles J. Sutter, 1303 Pine St., St. Louis	W. F. Gerstner, 120 North Second St., St. Louis
New York:	A. Lincoln Bush, 906 6th Ave., New York City	H. F. Janick, 235 Berlin St., Rochester
North Carolina:	H. R. Bouligny, P. O. Box 534, Charlotte	W. P. Christian, Greensboro
Pennsylvania:	W. V. Pangborne, 1927 W. Montgomery Ave., Philadelphia	M. G. Sellers, 1202 Locust St., Philadelphia
South Dakota:	Mark J. Hurlbut, Chamberlain	Frank Shuff, Yankton
Tennessee:	R. L. Clift, Memphis	J. A. Fowler, 118 Monroe Ave., Memphis
Texas:	T. L. Farmer, 1809 Main St., Dallas	J. W. Read, 715 Capitol Ave., Houston
Wisconsin:	L. W. Burch, 202 E. Wash'n Ave., Madison	

List of Local Associations

STATE AND CITY	LOCAL SECRETARY	STREET ADDRESS
ALABAMA		
Birmingham (C)	J. R. Wilcox	2017 First Avenue
ARKANSAS		
Fort Smith (C)	Edward Ryan	Ft. Smith Lt. & Trac. Co.
CALIFORNIA		
Fresno (C)	Clyde L. Smith	1162 Broadway
Glendale (C)	W. L. Hyde,	154 S. Brand Blvd.
Long Beach (L)	V. Ringle	So. Cal. Edison Co.
Los Angeles (C)	Helen I. Mikesell	1009½ S. Hill St.
Oakland (C)	Laurence R. Chilcote	Hobart & Webster Sts.
Pasadena (C)	H. W. Barnes	1331 N. Lake Ave.
Sacramento	L. W. Sherman	910 Ninth St.
San Francisco (C)	E. E. Browne	522 Call Building
Santa Ana (C)	O. N. Robertson	303 N. Main St.
Eureka (C)	J. H. Hilfiker	1717 H Street
COLORADO		
Colorado Springs (C)	Matt Whitney	208 N. Tejon St.
Denver (C)	E. C. Headrick	89 Broadway
Pueblo (C)	E. F. Stone	So. Colorado Power Co.
CONNECTICUT		
Hartford (C)	A. A. Angello	473 Park St.
Waterbury (C)	D. B. Neth	107 West Main St.
Bridgeport (C)	L. E. Finch	529 Newfield Bldg.
DIST. OF COLUMBIA		
Washington (L)	P. A. Davis	1328 Eye St., N. W.
FLORIDA		
Bradentown (C)	W. S. Stewart	W. & S. Elec. Co.
Daytona Beach (C)	C. Leotah Benson	324½ S. Beach St.
Deland (C)	C. W. Allcorn	132 No. Florida St.
Fort Myers (C)	P. K. Weatherly	Thompson-Weatherly Co.
Indian Riv. Dist. (C)	I. A. Paige	Vero Beach
Jacksonville (C)	W. A. Harper	108 W. Bay St.
Miami (C)	E. A. Robinson	118 N. W. First Ave.
Orlando (C)	Solon M. Lantz	833 E. Concord
St. Petersburg (C)	Gardiner Blackman	.....
Tampa (C)	P. F. Lyons	P. O. Box 992
GEORGIA		
Atlanta (C)	B. K. Laney	73 Walton St.
Savannah (L)	Sylvan M. Byck	Byck Electric Co.
ILLINOIS		
Chicago Electrical Contractors' Association	J. W. Collins	230 No. LaSalle St.
Master Elec. Contractors' Association	F. J. Boyle	304 S. Halsted St.
Decatur (C)	Earl Weatherford	114 East William St.
Granite City (C)	Paul S. Pender	1916 Edison Ave.
Peoria (C)	L. B. Van Nuys	238 So. Jefferson Ave.
Rockford (C)	Donald Johnson	106 North Second St.
Springfield (C)	A. D. Birnbaum	916 West Cook St.
Wheaton (C)	E. C. Krage	133 West Front St.
INDIANA		
Lake County (C)	A. R. Irwin	3461 Mich'n Av., Ind. Har.
Indianapolis (L)	A. W. Kruge	2405 E. Tenth St.
Michigan City (C)	Walter A. Sassodeck	913 Franklin St.
Muncie (C)	Harry McCullough	113 W. Howard St.
South Bend (C)	R. A. Frink	1338 Howard St.
Terre Haute (C)	C. N. Chess	523 Ohio St.
IOWA		
Cedar Rapids (C)	H. E. Neff	94 First Ave., West
Davenport (C)	Louis F. Cory	510 Brady St.
Des Moines (C)	Floyd J. Moeckly	521 Hubbell Bldg.
Fort Dodge (C)	J. A. Paul	16 So. Twelfth St.
Sioux City (C)	E. A. Arzt	211 Fifth St.
Waterloo (C)	R. A. Cole	Cole Bros. Elec. Co.
KANSAS		
Salina (C)	C. G. Loomis	814 Cedar St.
Wichita (C)	P. W. Agrelius	Wichita
KENTUCKY		
Lexington (C)	J. H. Brock	235 East Main St.
Louisville (C)	C. L. W. Daubert	921 South Third St.
Paducah (L)	K. H. Knapp	c|o Paducah Electric Co.
LOUISIANA		
New Orleans (C)	I. G. Marks	406 Mar. Bk. Bldg.
Shreveport (C)	R. L. Norton	620 Marshall St.
MARYLAND		
Baltimore (C)	A. P. Peterson	515 Cathedral St.
MASSACHUSETTS		
Lowell (C)	George A. Ryan	79 Middle St.
Haverhill (C)	H. W. Porter	14 West St.
Malden (Medford, Everett and Melrose) (C)	H. J. Walton	c|o Malden Electric Co.
Springfield (C)	C. S. Foster	220 Dwight St.
Worcester (L)	John W. Coghlin	259 Main St.
MICHIGAN		
Detroit (C)	N. J. Biddle	112 Madison Ave.
Grand Rapids (C)	T. J. Haven	1118 Wealthy St., S. E.
Kalamazoo	E. R. Hummel	1121 Seminary St.
Saginaw (C)	E. T. Eastman	209 Brewers Arcade
MINNESOTA		
Duluth (L)	Morris Braden	c-o Minn. Pow'r & Lt. Co.
Minneapolis (C)	W. I. Gray	209 Globe Building
MISSOURI		
Kansas City (C)	Walter C. DeBold	City Bank Bldg.
St. Louis Electragists' Ass'n (C)	W. F. Gerstner	120 No. Second St.
Electric Employers' Association (C)	G. L. Gamp	Wainwright Bldg.

STATE AND CITY	LOCAL SECRETARY	STREET ADDRESS
NEBRASKA		
Lincoln (L)	George Ludden	1329 N Street
Omaha (C)	E. H. Brown	1818½ Harney Street
NEW JERSEY		
Elizabeth (L)	A. G. Otis	Broad Street
Jersey City (C)	John Nairn	38 Oakland Ave.
Long Branch (C (Asbury Park and Red Bank)	Austin Hurley	Campbell Ave., Long Branch
Newark (C)	Paul H. Jaehnig	435 Orange Street
Paterson (L)	George Pape	43 Fair St.
Philipsburg (See Lehigh Valley, Pa.)		
Union City (C)	Frank Zeller	328 48th Street
NEW YORK		
Buffalo (L)	Samuel S. Vineberg	307 Electric Bldg.
Brooklyn (C)	H. F. Walcott	60 Third Avenue
Jamestown (C)	Henry M. Lund	309 Main Street
Nassau-Suffolk (C)	Henry T. Hobby	55 Front Street, Rockville Centre, L. I.
New York City Section No. 1 (C)	Walter Knapp	207 East 43rd Street
Independent (C)	Albert A. A. Tuna	127 East 34th Street
Metropolitan (C)	George W. Neil	96 Beekman St.
Niagara Falls (C)	E. M. King	515 Niagara Street
Rochester (C)	Theo. T. Benz	278 State Street
Schenectady (C)	Richard Spengler	421 McClellan Street
Syracuse (C)	Fred P. Edinger	802 East Water St.
Utica (C)	W. C. Balda	228 Genesee Street
Westchester Co. (C)	Jack Lalley	14 Mnr. Hse.Sq.,Yonkers
Yonkers (C)	Louis Mayer	485 South Broadway
OHIO		
Akron (C)	E. C. Rishel	540 East Avenue
Canton (C)	H. S. Hastings	301 New Vickery Bldg.
Cincinnati (C)	J. F. Riehle	1642 Cedar Ave.
Cleveland (C)	F. T. Manahan	Chester Twelfth Bldg.
Columbus (L)	O. A. Robins	1242 Oak Street
Lorain (C)	A. B. Walton	3150 E. Erie Ave.
Toledo (C)	Fred C. Dunn	Builders' Exchange
Dayton (C)	Clarence Carey	1107 South Brown St.
Massilon (C)	F. D. Mossop	c-o Mesco Electric Co.
Northern Ohio (C)	R. A. Wentz	Elyria
OKLAHOMA		
Pawhuska	C. G. Sego	Pawhuska
OREGON		
Portland (C)	J. R. Tomlinson	51 Union Ave. N.
PENNSYLVANIA		
Altoona (C)	Walter Bracken	Leechburg
Allegheny Valley	E. G. Jackson	12 West Third Street
Du Bois (C)	C. E. Blakeslee	12 E. Long Av.
Erie (C)	R. D. Goff	11th and French Sts.
Lehigh Valley (C)	A. W. Hill	Bethlehem
Philadelphia (C)	M. G. Sellers	1202 Locust Street
Pittsburgh (C)	D. A. Fleming	518 Empire Bldg.
Wilkes-Barre (L)	Leon N. Sell	Town Hall
RHODE ISLAND		
Providence (C)	H. E. Batman	36 Exchange Place
SOUTH CAROLINA		
Charleston (L)	J. P. Connolly	141 Meeting Street
SOUTH DAKOTA		
Sioux Falls	H. W. Claus	326 S. Phillips Ave.
TENNESSEE		
Chattanooga (L)	P. W. Curtis	725 Walnut Street
Knoxville (L)	Jerry G. Cason	303 West Church St.
Memphis (L)	J. J. Brennan	12-16 So. Second St.
Nashville (C)	J. T. Shannon	c-o Electric Equip. Co.
TEXAS		
Beaumont (C)	J. A. Solleder	Houston & Bolivar Sts.
Dallas (C)	P. B. Seastrunk	2032 Commerce St.
Houston (C)	J. W. Read	715 Capitol Avenue
UTAH		
Ogden	B. Kristofferson	2249 Washington Ave.
Salt Lake City (C)	C. Louis Collins	215 Kearns Bldg.
VIRGINIA		
Lynchburg (C)	J. L. Fennell	c-o Fennell & App
Norfolk (L)	A. W. Cornick	200 Plum St.
Richmond (C)	E. M. Andrews	15 N. Twelfth Street
WASHINGTON		
Seattle (L)	P. L. Hoadley	Seaboard Building
Spokane (C)	William Stack	W. 1121 Cleveland St.
WEST VIRGINIA		
Wheeling	Peter J. Erb	1414 Eoff St.
WISCONSIN		
Green Bay (C)	V. E. Grebel	531 S. Broadway
Madison (C)	Carl J. Marsh	710 Beaver Bldg.
Milwaukee (C)	E. H. Herzberg	1604 Wells Street
Racine (C)	Joseph J. Small	1910 Linden Ave.
CANADA		
Montreal (C)	George C. L. Brassart	674 Girouard Ave.
Toronto (C)	J. A. McKay	302 Excelsior Life Bldg.
Vancouver (C)	J. C. Reston	579 Howe St.
Winnipeg (C)	Fred Ball	300 Princess St.

(C) designates exclusively Contractor-Dealer organization.
(L) designates an Electrical League.

DECEMBER ACTIVITIES

Executive Committeemen Elected

Five Positions on Executive Committee of the Association of Electragists Filled in Election

THE following five electragists were elected to represent various divisions of the Association of Electragists on the executive committee as a result of elections held December 12, 1927:

A. C. Brueckmann, Eastern Division
Charles E. James, Southeastern Division
L. E. Mayer, Great Lakes Division
E. C. Headrick, Mountain Division
John H. Schumacher, Western Canadian Division

All except Mr. James have been serving on the executive committee and were elected to succeed themselves. Mr. James of Fort Pierce, Florida, represents a new division created by the executive committee at the meeting of March, 1927, when it was decided that in view of the great area covered by the southern division it would be wise to make a new division to cover the states of Virginia, West Virginia, North Carolina, South Carolina and Florida, to be known as the southeastern division.

C. E. James, newly elected executive committeeman, was born in Port Arthur, Canada, in 1888. In 1904 he began his electrical career with Ross & McClaren, contractors in Sault Ste. Marie, Mich. In 1913 Mr. James established his own electrical contracting business in Fort Pierce, Fla., where he conducts a general contracting and merchandising business. He has been active in association affairs for several years.

A. C. Brueckmann is president of the Brueckmann Electric Company, Baltimore, Md.; L. E. Mayer is president of the White City Electric Company, Chicago, Ill., E. C. Headrick is owner of the Headrick Electric Company, Denver, Col., and John H. Schumacher is president of the Schumacher-Mackenzie-Kummen, Ltd., of Winnipeg, Canada.

The new committeemen took office on January 1, 1928, to serve for two years.

The complete executive committee, including the new and re-elected members as well as the members whose term of office has another year to run, will hold their next meeting in March, 1928. The additional executive committeemen are: J. A. Fowler, southern division; A. Penn Denton, central division; C. L. Chamblin, Pacific division; R. A. L. Gray, eastern Canadian division; S. J. Stewart, open shop section; W. Creighton Peet, union shop section, and G. E. Shepherd, at large.

C. E. James

Motor Committee Appointed

Representatives of leading motor manufacturers have been appointed National Electrical Manufacturers' Association members of the joint committee on motor merchandising which will meet with the members of the national motor section committee of the Association of Electragists to consider problems affecting motor distribution.

O. F. Stroman, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., is chairman of the manufacturers' section of the joint committee; other members are: Clarence L. Collens, Reliance Electric and Engineering Company, Cleveland, Ohio; L. W. Grothaus, Allis Chalmers Manufacturing Company, Norwood, Ohio; Fred M. Kimball, General Electric Company, West Lynn, Mass., and R. J. Russell, Century Electric Co., St. Louis, Mo.

Members of the committee from the Association of Electragists are: George H. Jacob, chairman, Louis Kalischer, James A. Feeley, J. Roland Stolzenbach, Thomas G. Hodgdon, Harry Donaldson, Henry Trester, George P. Svendsen, Fred E. Briner, A. Penn Denton, L. M. Atkinson, W. W. Hanks, S. J. Stewart, W. M. Clower, F. T. Broiles and Frank O. Sievers.

Northwest Inspectors to Meet

The third annual meeting of the Northwest Association of Electrical Inspectors will be held in Seattle, Wash., January 26, 27 and 28, 1928. The program includes addresses by the Mayor of Seattle, J. A. Laing of the Pacific Power and Light Company, and the following:

W. A. Gorce, Assistant State Fire Marshal of Washington, "Serving the Public"
William Meacham of Meacham & Babcock, "Just a Talk by an Old Timer from the Firing Line"
H. B. Kirkland, Society for Electrical Development, "The Uniform Electrical Ordinance"
L. W. Going, chief electrical inspector of Portland, Ore., "Regulation of Lighting and Appliance Loads"
R. E. Laing, city fire marshall, Seattle, "Do We Need Reinspection?"
S. W. Borden, Crouse-Hinds Company, "Grounding"
J. C. Caine, deputy electrical inspector of Portland, "Is the Public Benefited by Municipal Control of Sale of Electrical Equipment?"
G. K. Comstock, Electrical Products Corporation, "Neon Signs."

Officers of the association are: H. S. Jenkins, president; T. W. Carlon, vice president, and F. D. Weber, secretary-treasurer.

Leagues to Develop Electrical Business

Approximately $800,000 will be spent by 91 electrical leagues throughout the United States and Canada during 1928 to develop business in wiring, lighting, appliance and industrial fields, according to a survey just completed by the league council of the Society for Electrical Development, J. E. North, chairman of the council, has announced.

The Biggest Electrical Christmas

FROM a tiny thought in Denver, Col., to a nation aglow with Christmas light, has been the growth of the idea of outdoor electrical decoration for the holiday season. Christmas, 1927, found thousands of homes and commercial buildings decorated, in hundreds of towns and cities throughout the nation. The use of outdoor lighting effects was more widespread than ever before, much of the work being done by organizations of electrical contractors, electric leagues, etc.

The Society for Electrical Development contributed a complete plan for Christmas exterior home lighting installations and contests, based on the previous years' work of the Electrical League of Colorado, covering such points as: Getting newspaper cooperation, holding intercommunity contests, a community Christmas tree and emphasizing the necessity of safe installations.

The National Tree

President Calvin Coolidge pushed the button which lighted the national Christmas tree in Washington, D. C., which was installed at the Capitol by the Electrical League of Washington. The committee appointed to have charge of the lighting included: T. Lincoln Townsend, L. T. Souder, George Colbeck, H. A. Brooks and R. P. Harrington.

Community Christmas trees were put up, decorated and lighted in a large number of cities. In Chicago, where there was a great deal of outdoor electrical illumination, the Department of Gas and Electricity issued a proclamation inviting citizens to call upon inspectors to examine proposed installations to see that too great a demand for current was not made upon the ordinary circuits. The Chicago Electric Association and many Chicago contractors performed the same service in order to make the decorations as safe as possible.

In Minneapolis the outdoor Christmas lighting contest was a great success, much publicity appearing in the newspapers, talks being given over the radio every morning. "Miss Santa Claus" was appointed to visit luncheon clubs and give a short talk on the drive to make Minneapolis "The Brightest Christmas City." The Mayor sent telegrams to nearby cities challenging them to try to surpass Minneapolis in outdoor decorations.

In Salt Lake City the league prepared a pamphlet showing the many possibilities of decoration which was sent out by dealers to anyone interested in outdoor illumination and members of the league began the outdoor decoration with their own homes and business locations.

The central station of Rochester sent out direct-mail efforts to every electrically wired home in the community urging outdoor decoration and illumination, and the contractors secured a good share of the Christmas lighting sales and the installation jobs.

Cincinnati had a very successful campaign with prize contests in 15 districts of the city for the best outdoor tree decoration. A number of contractors were called upon for elaborate and permanent wiring installations, and quite a few underground connections from house to trees were put in. The Cincinnati Electric Club was active in the campaign and furnished display window cards describing the decorating contests. It also published a folder giving suggestions for outdoor decoration.

The Civic Club of Allegheny County and a local Pittsburgh newspaper combined in a campaign for "making the outdoors bright with Christmas light." An attractive six page folder was sent to citizens of the community with pictures of typical lighting decorations, and suggestions for lighting Christmas trees and shrubbery. The Electric League of Pittsburgh cooperated by giving advice on the use of lamps and other information.

In Other Cities

A Christmas Cheer contest was held in Milwaukee, under the auspices of the league and the local newspapers, with prizes for the best decorations for homes, churches, business associations, and suburban communities. The league sent letters to social and educational groups suggesting that they decorate, and furnished publicity material and information.

In the Central Hudson Valley region the Christmas campaign included lighting contests and efforts to develop civic pride in decorations for homes, stores and public buildings. The electric leagues and newspapers cooperated in prize contests, giving electrical merchandise to the winners.

In Kansas City the contractors, dealers and jobbers distributed "Yuletide Lighting" booklets to their customers which were prepared by the electric club. Newspaper advertisements offered the public a free copy of the booklet, and letters suggesting "light up for Christmas" were mailed to business and store buildings, churches, improvement associations. Cash prizes amounting to $1,000 were given in contests conducted by a local newspaper.

Other cities had similar campaigns and outdoor decoration was much more widespread than ever before.

"Give Something Electrical"

Several leagues and associations throughout the country spent some of their advertising appropriation on the

"give something electrical" campaign during December. The Chicago Electric Association ran the attached advertisement in each of the Chicago papers during the month.

League Secretaries to Confer

A mid-winter convention of league secretary-managers will be held in Chicago January 16 and 17, with headquarters at The Electric Association. The program covers such details as: Development of the Red Seal plan, promotion of lighting, appliance and industrial fields and a review of the activities of the leagues.

The program provides for discussions in which league secretaries can exchange experiences on plans and problems that have developed during the six months since the annual summer conference at Camp Cooperation.

Testimonial for A. C. Brueckmann

A testimonial dinner was held December 29 in Baltimore, Md., for A. C. Brueckmann, president of the Maryland Association of Electragists, and member of the executive committee of the A. E. I. A gold watch was presented to Mr. Brueckmann as a recognition of his services to the electrical industry. The committee in charge of the dinner included J. Roland Stolzenbach, John S. Dobler and Arthur P. Peterson.

Fixture Manufacturers to Meet

January 25-28, Winton Hotel, Cleveland, Ohio, are the dates and place set for the annual meeting of the Artistic Lighting Equipment Association. Business to be considered includes: Election of officers for 1928, a discussion of the complete 1928 program of the activities of the organization and the details of the national lighting equipment exhibition to be held in Chicago, June, 1928.

Directors Elected

Thomas O. Meade, president, Meade Electric Company, and J. N. Pierce, president, Pierce Electric Company, both of Chicago, have been elected to the directorate of the Chicago Electric Association for two-year terms. Mr. Meade represents the contractor-dealer group; Mr. Pierce the electrical contractor group.

Master Electricians Join League

After a special meeting of the Massachusetts Master Electricians' Association in Cambridge, Mass., twenty members of the electricians' group joined the Metropolitan Electrical League of Boston. Edward G. Jay, manager of the league, addressed the meeting and described the organization and operations of the league, explaining that it was established for the benefit of every branch of the electrical industry equally, that every group has equal rights of expression, that all groups benefit financially by joining forces. He showed the necessity of informing the public that a master electrician is a man who has prepared himself by study and practical work to direct others and is licensed by the State of Massachusetts to do business in a medium that means as much in human life and safety as, and a lot more in property than, the problems a modern doctor or lawyer has to face.

"The business promotion plans of the league for 1928," Mr. Jay stated, "include a budget of some $25,000, and depend for their effectiveness on the cooperation of our contractor-dealer members."

The attitude of the jobbers to contractors was discussed and Mr. Jay pledged all jobbers who were league members to treat contractors fairly. "Jobbers are not mind readers," he said, "and unless the contractor-dealers get together and state what they want it is difficult to help them. Jobbers will do anything in reason to improve business. They have said so."

Mr. Jay summarized a paper by S. L. Nicholson, of the National Electrical Manufacturers' Association, on the subject "The Need for a Uniform Electrical Ordinance", describing the nation-wide movement for standardization of state and municipal ordinances so that high quality electrical materials can be manufactured under standard specifications, with a resulting lowering of cost of installation. "The proposed unification," Mr. Jay said, "has the virtue of giving all electrical groups what they want without taking away their prerogatives, if any. Some may inquire how this may be brought about practically. It is simply an organization job, which means that each locality may work toward the common end by determining upon a local clearing house for existing special rules. Bring them all together, analyze them with the very men who make the codes, and adopt the one best method of handling each subject. The logical local clearing house is the electrical league in each community. The

Slogans to Advertise Red Seal

THE Society for Electrical Development has composed a number of slogans to use in advertising Red Seal and better wiring. These slogans may be used by contractors in advertising, letters, on billboards, etc. The Red Seal emblem, of course, can only be awarded to residence buildings adequately wired according to the requirements established by the Society for Electrical Development. The following slogans may be used:

1—We endorse the Red Seal Plan of Adequate Wiring for homes
2—Red Seal means adequate home wiring and electrical satisfaction
3—Red Seal is your standard for home wiring installations
4—Look for the Red Seal—it identifies the adequately wired house
5—Think of Red Seal when you think of electric wiring
6—Red Seal—the national standard for house wiring
7—Red Seal wiring assures comfort, convenience and availability of electric service through accepted wiring
8—Demand the accepted standard in house wiring—the Red Seal Where you want it
9—For Electric Service and Insist on Red Seal When you want it
10—Modernize the wiring of your home—specify Red Seal
11—Red Seal—the hallmark of electric wiring
12—Built Right—Means Wired Right—a home well wired preserves its value through time
13—Red Seal, the national standard of house wiring, enhances the resale value of your home
14—When you build—make the first cost of wiring—the last cost—by demanding Red Seal
15—The Red Seal identifies a house wired to modern standards
16—You want to be modern—then have your home wired to Red Seal standards
17—Wiring mistakes are costly—avoid them by demanding the accepted standard of electrification—the Red Seal Plan of Adequate Wiring

work of analysis will be done by a national organization, the Society for Electrical Development."

Following the discussion twenty master electricians joined the Metropolitan Electrical League.

Children Advertise Electrical Decorations

A unique plan for advertising electrical Christmas decorations was put into operation early in December by the electrical league of Minneapolis. The plan secured the cooperation of the children of the city by means of a chain letter. The master letter was written by the league and copies sent to each member who was instructed to turn it over to one of his children. The letter instructed each child to write four copies of the same letter and send it to four friends. It was estimated that within three days each letter had been multiplied to 64 letters and that throughout the city there were 12,800 letters urging electrical decorations outside the home. The letter follows:

Dear Little Friend:

Santa Claus will soon be coming around again. Have you written Santa Claus—telling him what you want him to bring? I have!

Last Year—Santa Claus found our city easy to drive around in because—Minneapolis was the Brightest Christmas City. Let us help him again this year.

We are going to put up some lighted outdoor decorations, maybe some candles in the windows, too, and I hope Santa and everybody will enjoy them. Will you do the same? Your friend,

P. S. This letter was mailed to me. Will you copy it today, word for word, and send it to four of your friends? Thank you.

Christmas Slogans

"Everyone lit by December 15th" was the slogan adopted in Milwaukee for the stimulation of outdoor Christmas decorations.

New S. E. D. Directors

Roger A. Gordon, general sales manager, Blackstone Valley Gas and Electric Company, Pawtucket, R. I., and E. M. Ashworth, general manager, Toronto Hydro-Electric System, Toronto, Canada, have been appointed league representative directors for the reorganized Society for Electrical Development. Mr. Gordon is a former president of the Rhode Island Electric League and a present member of the league council; Mr. Ashworth is a director of the Electric Service League of Toronto.

Ordinance on Sale of Electrical Devices

AN EXPERIMENT in city ordinances, just passed in Charlotte, N. C., requires persons not licensed contractors, dealers, or power company, to report the sale of current consuming devices rated at more than 660 watts which are to be used on the lighting system. Such persons or firms are also required to furnish a surety bond before offering these large current consuming devices for sale. This is the most unusual section in the newly revised Charlotte local ordinance which became effective January 1.

The Maryland Association of Electragists uses space in the Baltimore telephone directory to tell its story of responsible contracting

Other changes were as follows: No service wires shall enter buildings except through rigid iron conduit; metal wiring must be used in apartments, and certain business buildings, in addition to hospitals, depots, churches, theaters, hotels, lodge rooms, public or private schools and factories.

W. M. Sullivan, electrical inspector, city of Charlotte, N. C., discussing the new city ordinance on the sale of large electrical devices said:

This ordinance is not for the purpose of producing revenue, as no fees are charged, but to enable the inspection department to check up on the wiring on premises where the device is to be used. I believe that a condition such as was found here is general throughout the country. Itinerant salesmen selling current consuming devices rated at 1,000 to 5,500 watts are advising the purchaser to connect to any convenient lamp socket or receptacle on the light circuit. A dealer in household supplies sold a cooking device rated at 5,500 watts to a quick lunch operator and advised him to connect to lamp socket or receptacle for current supply. The result was a fire. A check up throughout the city, made recently, disclosed that several 2,750 watt cooking devices in cafes and quick lunch stands were connected to the most convenient lamp socket on circuits that were already carrying 1,000 to 1,500 watts lighting load. In every instance it was found the purchase was made from salesmen or non-licensed electrical dealers who knew nothing about the safe carrying capacity of wiring and fittings. When an electrical dealer sells current consuming devices rated at more than 660 watts he explains to the purchaser that a separate circuit or other necessary changes in the wiring are imperative to use the appliance without creating a fire hazard. Nor does the electrical dealer jeopardize his reputation or the possibility of having his license cancelled by selling devices not suitable for connection to an ordinary lamp socket without ascertaining from the customer how it is to be used and advising the necessary changes in wiring. If it is necessary to wire in a new circuit he makes application for wiring permit to do whatever is required, while the non-licensed dealer such as hardware stores, drug stores, furniture and department store people secures no permit because he knows nothing about what is to be done to the wiring in order to use the appliance safely. Therefore the inspection department is unable to advise the purchaser, having no means of securing information. No inspection department can dictate a merchandising policy, or state what they may or may not sell, but it is apparent that if a certain article of merchandise when improperly used becomes a fire hazard regulations can be made for this particular device just as for the manner in which wiring may be installed, or dynamite be stored.

The local power company furnishes a heating rate on cooking devices rated at 4,000 to 5,000 watts or more. This rate is less than one-half that charged for lighting. To secure this rate separate service and wiring is necessary. This is not generally known by the itinerant salesman or non-licensed electrical dealer, and the purchaser attempts to use the device connected to the lighting circuit. Invariably the fuse blows, and is either bridged with penny or replaced with one larger than the safe carrying capacity of the wire. This condition is the cause of at least 90 percent of the so-called electrical fires. I have found that more fires are started from the improper use of electric wiring than from defective or improperly installed wiring.

This ordinance is an experiment. We do not expect it to be the cure for all the ills referred to, but it will be tried as a means of regulating sales and use of certain electrical appliances.

Should City Light Departments Merchandise?

Contractor-dealers of Seattle argued that neither the city light department nor the privately owned central station should merchandise appliances at hearings before the Seattle city councilmen recently. "Dealers in electrical supplies have a hard enough time to get by," declared J. M. Hooper of the Rainier Electric Company, "and they ought not to be forced to meet competition by the city government, for the maintenance of which they pay taxes. The Puget Sound Power and Light Company will go out of the business if the city will." When one of the councilmen asserted that 60 percent of the central stations of the country are selling appliances Harry Byrne, president of the North Coast Electric Company, jobbers, said that these companies are quite generally going out of the business and pointed to the situation in California. He protested against the "unfair business tactics" of the city light department.

Good Lighting Improves Business

Good illumination doubles the pulling power of a store, according to tests recently conducted by the Electric Service League of Toronto. An increase of window intensity from 15 ft.-candles to 40 ft.-candles increased stopping of passers-by by 33 percent the tests showed. In the case of four stores on the wrong or dark side of a street good lighting brought 53½ percent of the passers-by to that side and stopped 35 percent instead of 2½ percent. Modern illumination intensity in the ground floor of a department store increased customers 33 percent, sales 11 percent, average sale 29 percent.

Michigan Inspectors Publish Magazine

The Michigan Association of Electrical Inspectors has started a four page magazine for the benefit of members under the editorial management of Ben W. Clark, H. L. Sanderson, and H. F. Cook. Associate editors are: G. W. Cotton, James Niven, C. R. Clarke, S. Talbot, Fred Tyack, Jesse Pearce, Fred Hauser, Al G. Soop, R. M. Hitchings, H. E. Oswald, and Ed. W. McCully.

Officers of the Michigan association elected at the last annual meeting are: President, A. T. Babbitt; Vice Presidents, H. Roughly, G. W. Cotton, and R. C. Loughead; and Secretary-Treasurer, J. J. Gilbert, Jr.

Chicago Jobbers Adopt Credit System

A cooperative system for transferring credit information about electrical contractors has been put into operation by electrical jobbers of Chicago, Ill., through the Electrical Credit Association. Once a month the jobbers meet together and discuss one by one the credit standing of contractors under consideration. Any jobber who has information on the man under discussion gives it to the group and the complete story, including such information as how contractors pay their bills, do they make unjust claims, etc., is made available. From each meeting the jobbers take back to their offices confidential records, history and character information in a form which can be kept in permanent credit files for future reference. Special investigating committees are appointed to consider and report on involved cases.

Albany Selling Red Seal

Charles Russell, president, Albany Electric League, announces that the total number of Red Seal applications in Albany is now 46. H. A. Collman is the leading Red Seal contractor to date, with six applications to his credit, while H. Zielke has five.

Demand for Union Label Illegal

That it is illegal for local unions to demand a union label on electrical fixtures and other material they might be called upon to install is the opinion of the leaders of the International Brotherhood of Electrical Workers, as a result of the Supreme Court decision on the Bedford Cut Stone Company case, described in the November issue of THE ELECTRAGIST. J. P. Noonan, president of the I. B. E. W., and G. M. Bugniazet, secretary, have written to the various locals affiliated with this union, instructing members "that the recommendations of our previous convention in requesting local unions to demand the union label on goods which they handle, and especially on electric fixtures, cannot be enforced; and we trust your local union will refrain from taking a position that will bring it into conflict with the decision rendered, which so far as force and effect is concerned, is practically law."

"The gist of the majority opinion of the Supreme Court," according to the letter, "is that the Journeymen Stone Cutters had not the right to refuse to work on stone that was quarried and partially cut by non-union men; that their action was in restraint of trade and interfered with interstate commerce, and was, therefore, in violation of the Sherman Anti-Trust Act."

Baltimore Examiners Appointed

The following have been appointed members of the board of electrical examiners and supervisors for Baltimore, under the Maryland law: George W. Wilkinson, who succeeds himself, and Joseph A. Becker, who succeeds Frank Stark, from the Electrical Contractors' Association; John S. Dobler, to succeed Eli Goldenberg, representing the city of Baltimore; Joseph O'Brien, to succeed himself, to represent the board of fire underwriters, and J. Roland Stolzenbach, to succeed G. E. Painter, as the personal appointee of the Governor. The appointments are for two years.

Progress in Washington, D. C.

Dean Gallagher, secretary-manager of the Washington Electric League, has announced that 56 houses in Washington have been awarded the Red Seal. Edward R. Bateman is chairman of the Red Seal committee.

Metropolitan Grounding Committee Authorized

A committee on grounding has been authorized by the New York chapter of the Eastern Association of Electrical Inspectors to "review the present grounding methods and out of the chaos, devise rules and regulations for a uniform and better method of installation of the grounding wires, with particular attention to the system ground." The announcement states that "if an effective uniform method can be devised, which will be in compliance with the Code and the New York City Code, it is probable that it will be adopted for the metropolitan district."

Factory Lighting Campaign

Contractors, jobbers, manufacturers and the central station of the Central Hudson Valley, New York, are working together on a factory lighting campaign designed to bring in a large amount of refixturing and rewiring business. The campaign is being actively merchandised by the Central Hudson Gas and Electric Company, which is sending three mailing pieces to each of the prospective factory prospects in the territory. In addition each of the leading jobbers of factory lighting equipment is sending one or two pieces to the same list, which is followed up by calls by lighting engineers of the central station and by salesmen of the contractors.

In the calls the first attempt is to have the prospect authorize the lighting engineer to redesign his lighting layout. This is presented to the customer in the form of a lighting recommendation with suggested wiring layout and equipment. If it is impossible to get the prospect to consider a lighting plan the next effort is to secure an opportunity to install a model layout. This is done in one section of the factory where the improvement in lighting will be easily observed and in this case the jobbers loan the equipment while the contractor who gets the job loans the wiring. In more than 75 percent of the cases, where a sample lighting layout has been installed, the customer has ordered the factory completely and permanently rewired and refixtured.

The campaign started December 5 and will end April 28.

New League in Fall River

An electrical league has been formed in Fall River, Mass., with the following officers: John Earnshaw, president; Nelson E. Smith, secretary; John E. Brady, treasurer; Joseph C. Giblin and William T. Welch, members executive board.

Dealers Organization to Install Officers

Members of the Independent Associated Electrical Contractor-Dealers of New York City will hold their 24th annual installation dinner and dance on the evening of January 11 at the Hotel Astor. Tickets may be obtained from the secretary, Albert A. A. Tuna. The chairman in charge of the program is A. Lincoln Bush; Louis Freund is in charge of publicity.

Illegal Use of Word "Electragist"

Electrical contractors may not use the word "electragist" unless they are members of the Association of Electragists, International, according to Laurence W. Davis, general manager, who in a recent instance succeeded in stopping M. L. Boyer of Hobart, Ind., from illegally using the word. "This word was coined by a member of the Association of Electragists," Mr. Davis states, "and was registered as the Association's trademark in the United States and Canadian Patent Offices for the purpose of distinguishing electrical contractors and dealers who are members of the Association from those who are non-members. The courts have established the legal right of an association to the exclusive use of its own word in such circumstances."

Standard Red Seal Specifications Planned

W. E. Sprackling, chairman of the Red Seal planning committee of the S. E. D., has appointed a sub-committee to discuss a standard Red Seal specification. This committee has J. H. Van Aernam as chairman, with E. J. Beil, Dean Gallagher, G. D. Munger, M. H. Lloyd and H. E. Dawson to assist. Meetings are now being held and the committee will draft a suggested standard specification, which will be presented to the mid-winter conference for discussion.

Florida Electragists' Association Convention

Plans are shaping up for the annual convention and manufacturers' exhibition of the Florida Association of Electragists which will be held at Orlando, Fla., on February 23, 24 and 25. The program as tentatively arranged includes manufacturing exhibits in the mornings, with business meetings and addresses in the afternoons and entertainment programs, banquets and a dance in the evenings. A golf tournament will be held on Saturday, February 25. Charles E. James of Fort Pierce has been appointed acting secretary of the Association pending the next election at the annual meeting.

Performance Test for Heater Cords

Results of an extensive investigation on heater cords have just been issued by the National Electrical Manufacturers' Association and the National Electric Light Association. The work was done under the direction of a joint committee of both groups, of which Frank Thornton, Jr., of Westinghouse Electric and Manufacturing Company was chairman. The performance tests were conducted by Underwriters' Laboratories with a special machine which was designed to kink and unkink typical heater cords to determine how many times they could be kinked before they short circuited. After exhaustive tests it was decided to make minimum specifications for heater cord performance requirements which was set at 1,000 cycles on the testing device. Underwriters' Laboratories, through its established method of procedure, has incorporated this requirement into its standards for heater cords.

The most interesting features brought out by the test program were:

(1) The type of copper assembly is the governing factor in the performance of cords under this sort of test; but even the best of copper construction may be destroyed by poor workmanship in other items of construction.

(2) The addition of an inner braid is by far the strongest supplementary factor in adding to the endurance of cords under test.

(3) Cords constructed on a base conductor of 41 strands of No. 34 wires, braided, can apparently be depended upon to produce excellent results.

New Red Seal License

The Electrical League of Worcester County, Massachusetts, is the 83rd league to be licensed under the red seal plan, and the first red seal has already been awarded to a demonstration home owned by one of the builders. William F. Leathers, secretary of the Worcester league, will direct the Red Seal activities.

Central Station Lamp Policy

Another central station, the United Gas and Electric Company of Cincinnati, Ohio, announced last month that it would discontinue the sale of lamps at cost prices and would sell lamps only at the regular list.

Inspectors Receive Testimonials

AT a banquet in Chicago, Ill., December 8, commemorating the fortieth anniversary of the electrical inspection department in Chicago, Victor Tousley, chief of the department for the past 18 years, received a LaSalle automobile in testimony of his services to the electrical industry, especially during the last two years when Illinois was without a license law.

J. C. Forsyth, supervising engineer of the electrical bureau of the New York Board of Fire Underwriters, was honored at the Christmas luncheon of the New York Electrical League, when a platinum watch and chain were presented to him in recognition of his work in behalf of the electrical industry. Mr. Forsyth recently served as editor of the Code Chats section of THE ELECTRAGIST.

Red Seal Increases Outlets

That the Red Seal plan increases the number of outlets, even in houses which don't quite meet the Red Seal specifications, is the belief of G. W. Weston, secretary-manager of the Kansas City Electric Club. "Only recently," says Mr. Weston, "we turned down several well-wired homes because the rear entrance had no outside light controlled by a switch inside." The total number of Red Seal homes in the Kansas City territory is now 129, an average of seven a month since the plan was put into operation. A committee is working on some revisions of specifications.

Contractors Elect Officers

The non-union contractors group of Washington, D. C., elected L. L. Hayes as executive committeeman to succeed Edward R. Bateman and reelected R. L. McDormand as member of the executive committee at a recent meeting. Ralph P. Gibson was made secretary and Robert Smith chairman.

The union contractors group reelected Joseph Kirchner chairman. J. D. Macksey and Joseph Kirchner will be executive committeemen for 1928 and Leo W. Cleary secretary.

Classes for Contractors

A series of classes and lectures on various angles of the electrical contracting business will be given by the Electrical League of Utah this winter. Each subject will be handled by a capable instructor who is a practical man in the line being studied. Classes will be held once a week during the winter season, and the subjects will be studied by a program of lectures and question-recitations. Among the subjects to be covered are: Inside wiring, illuminating, motor winding, high tension and transmission work, elements of electricity, salesmanship and merchandising.

Red Seal Window Display

A complete window display of the Red Seal plan has been prepared by J. S. Bartlett, manager, Milwaukee Electric League, which may be used by contractors. The display was built for an 8-ft. window, but is adaptable to larger and smaller size windows.

Code School

Contractors of Los Angeles have established a school of code rule instruction for journeymen and foremen. The committee in charge of the school includes. M. L. Fish, Foulkes Electric Company; H. H. Walker and Duke Walker, Golden State Electric Company. Classes will meet every Monday evening beginning January 9. Otto Wiemer, of the Los Angeles Electrical Department, is to be the instructor, giving especial attention to Code requirements which are most frequently violated.

Penny Hazard Advertised

Samuel Talbot, electrical inspector of Clawson, Mich., recently advertised the hazard of the use of pennies behind fuses in an unusual way. A fire of electrical origin being reported in Clawson, Mr. Talbot investigated and discovered a penny under the fuse controlling the circuit on which the trouble showed. Connected to this circuit was a wall bracket hanging loose from the outlet and badly burned.

The fixture was mounted on a board, and displayed in a store window with an explanation of cause of the fire.

Canadian Code Printed

The new Canadian Electrical Code has been printed and may be had by writing to the Canadian Engineering Standards Association, 303 Bryson Building, 178 Queen Street, Ottawa, Canada.

Annual Meeting of Electrical Committee

The 1928 annual meeting of the Electrical Committee, N. F. P. A. will be held in the auditorium of the Consolidated Gas Company at 130 East 15th Street, New York, N. Y., beginning at 9:30 on the morning of Tuesday, February 14, 1928, and will be adjourned on Friday of that week.

OBITUARIES

Edward S. Keefer

The first honorary member of the Association of Electragists, a charter member and organizer of the first National Electrical Contractors' Association, Edward S. Keefer, died in New York December 18, 1927. One of the outstanding electrical contractors, in charge of the Western Electric Company's construction department, until it abandoned contracting in 1912, Mr. Keefer was known and loved throughout the country. The esteem in which he was held is demonstrated by the proceedings of the Twelfth Annual Convention of the National Electrical Contractors' Association, held at Denver, Colo., July 17-19, 1912.

Mr. Keefer announced that the Western Electric Company would discontinue the contracting department on August 1, 1912, and expressed his regret that he could no longer be associated with his many friends in the electrical contracting fraternity. J. C. Hatzel of New York, then spoke:

"When Mr. Keefer made the announcement that he would retire from the construction department of the Western Electric Company I was one who did not applaud. Although a keen competitor in New York City I love him still. He has been a competitor on a fair basis, and I think all of my associates in New York realize that we love Keefer for his fairness in every respect. I think that we in New York City, who know him personally better, perhaps, than do the members of the National Association, realize what we have lost.

We do not lose his friendship, but we lose his association. I, personally, regret it exceedingly."

G. M. Sanborn, Indianapolis: "Mr. Chairman, at the last annual convention there was a change in the Constitution and By-Laws and there was a provision inserted that none knew we would have an opportunity to take advantage of at such an early date. I refer to the fourth paragraph of Article V of the Constitution referring to honorary membership. We now have no honorary members in this Association, and I am going to make bold to propose to the Directors—I not being one of them—that they immediately convene and recommend to this Association that Mr. Eddie Keefer, our beloved co-worker, be made the first honorary member of the National Electrical Contractors' Association."

Whereupon the Directors immediately met and unanimously recommended that Mr. Keefer be made the first honorary member of the Association. This was presented to the convention as a whole and was passed immediately by a unanimous rising vote.

"In the death of 'Eddie' Keefer," James R. Strong said, "the electrical contracting industry loses one of its best friends and firm supporters. His illness for a number of years past had removed him from active work, but his genial countenance has done much to maintain a spirit of harmony in troubled times."

J. E. Wilson

J. E. Wilson of Wilson's Electric Shop, Los Angeles, Cal., died November 28 at his home. Mr. Wilson was engaged in the electrical business in Los Angeles for more than 25 years. He was a member of the Electrical Contractors and Dealers' Association and at one time acted as secretary of the organization. He had been in ill health for some time.

Harvey Sager

Harvey M. Sager, electrical dealer of Washington, D. C., died at his home November 11 after an illness of 10 days. Mr. Sager was an active member of the Washington Electrical League.

News Notes Concerning Contractor-Dealers

A new ornamental street lighting system has been installed in Bellingham, Wash., by the NePage-McKenney Company of Seattle. The installation includes 246 ornamental concrete poles on 33 blocks of sidewalk. Each pole bears two globes encasing two lights.

A new store has been opened by the V. & G. Electric Company in Wheeling, W. Va. Ophir Vellenoweth, owner and manager of the company, announced that a full line of radio, appliances and fixtures will be carried, in addition to the construction work handled. Small appliances and motors are repaired and a general wiring business conducted.

Larger space is available for display of fixtures and appliances in the new store of the Barclay Electric Shop, Saugerties, N. Y., recently opened. Growth of the business necessitated the larger quarters, according to Alfred Bushey, proprietor.

A bomb placed in the entrance of the Wright Electric Company, St. Louis, Mo., wrecked the front of the store and damaged stock to the extent of $300. Leslie A. Wright, proprietor of the store, was quoted as saying that he had been operating an open shop and repeatedly had been warned by telephone message to unionize his business.

The Forney Electrical Shop, Mechanicsburg, Pa., has moved to a new store, especially remodeled for the purpose. Display windows were built in which Mr. Forney shows appliances and fixtures he has for sale and the interior is laid out to display the merchandise to the best advantage.

New Electragists

The following contractor-dealers have made application and been accepted into the A. E. I. since the publication of the last list in the December issue:

CALIFORNIA

Los Angeles:
Electric Motor Service Co.

Riverside:
Electric Supply Co.

Santa Monica:
E. H. Bushow
Globe Elec. Co.
Montana Elec. Shop

Paso Robles:
Guarantee Elec. Shop

DISTRICT OF COLUMBIA

Washington:
Biggs & Kirchner, Inc.

GEORGIA

Atlanta:
Elecl. Engrg. & Repair Co., Inc.

KANSAS

Wichita:
Hogaboom's Elec. House

KENTUCKY

Covington:
The Wadsworth Elec. Mfg. Co., Inc. (Assoc.)

MARYLAND

Dundalk:
Dundalk Elec. Co.

Baltimore:
Shaw Elecl. Co.

MASSACHUSETTS

Boston:
Herbert A. Holder

Chicopee Falls:
John F. Kusmierz

Nantucket:
William Waine

NEW YORK

Brooklyn:
D. M. Carr & Son

Eden:
Wm. J. Rennagel

Fairport:
Ralph L. Richard

OHIO

Canton:
Industrial Elec. Constr. Co.

PENNSYLVANIA

Bloomsburg:
Geo. E. Keller

Philadelphia:
F. K. Courtney
Hulley Elec. Co., Inc.

WISCONSIN

Madison:
F. C. McAdams Elec. Co.

Monroe:
Louis E. Buri Elec. Co.

News of the Manufacturers

Plug Cap

Harvey Hubbell, Inc., Bridgeport, Conn., has added to its line a double "T" steel armored cap and bakelite cap for offices using electrically operated adding machines, etc., beauty parlors, hotels, garages and industrial

plants. The girder construction of the blades, which are riveted together adds strength. They can bend neither way in the receptacle when pulled. The metal covered cord grip cup is recommended by the manufacturer for heavy duty; the metal is galvanized. Both caps are rated 10 amp., 250 volts.

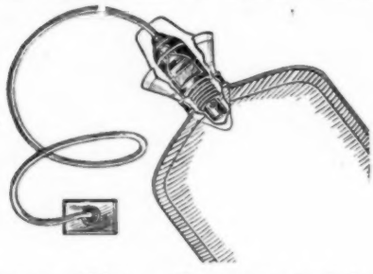
Sign Reflector

Wheeler Reflector Company, Boston, announces the new two-piece "Isolux Reflector"

for sign lighting. This construction requires no elbows, as the horizontal pipe screws directly into the canopy and special socket. The reflector is self-positioning, always facing the board directly. The different size units are interchangeable, since they all fit a standard size canopy.

Electric Stopper

An electric stopper for hot water bottles is being manufactured by Appleton Electric



Company, Chicago. The stopper is designed to keep hot water bottles at an even temperature.

Reversing Switches

General Electric Company, Schenectady, N. Y., announces three small switches for miscellaneous application as across-the-line reversing switches for small motors. Two types consist of two 15-amp., double pole contactors electrically and mechanically interlocked and enclosed in a drawn-shell case; they are designed for use with momentary contact push button stations. One is without overload relays; the other with them. Another type consists of two three-pole, 25 amp. contactors interlocked.

Fixture Hangers

Crouse-Hinds Company, Syracuse, N. Y., announces a new series of fixture hanger condulets in two styles: Ball and cushion, which provide a flexible suspension for electric fixtures. The ball fixtures are suspended from a universal joint which assures that the fixture will hang plumb. The universal joint permits the fixture to swing through an angle of about 20 deg. in any direction from the perpendicular. The cushion hangers provide a self-aligning, flexible cushioned suspension for fixtures with ⅜ or ½-in. stem. They are provided with means to prevent the turning or twisting of the fixture stem in such a manner as to injure the wires or connections. The flexibility of the suspension is designed to relieve the lamp from the effect of any lateral vibration and the cushion spring from the effect of any vertical vibration in the building.

Lamps

The Silvray Company, Inc., New York, have placed on the market a new lamp which has a permanent reflector silvered directly

upon it in such fashion as to control the direction of light rays coming from the filament. The lamp may be used in semi-indirect fixtures, show window lighting, theatrical lighting, etc.

Switches

Hart & Hegeman Manufacturing Company, Hartford, Conn., are now manufacturing a "tumbolier" switch for two and three circuit connections—3 switches in a single gang. The rating is 10 amp., 125 volts; 5 amp., 250 volts.

Attachment Plug

A new type of attachment plug, made of rubber, is announced by the Cutler-Hammer Manufacturing Company, Milwaukee. The rubber plug is unbreakable and may be used in factories, repair shops and by users of small motor driven tools where impact on cement or wood floors is likely. When the plug is used with rubber cord a small dab of ordinary rubber cement is placed between the two to fasten them together and relieve the strain between cord and plug.

Apartment House Boxes

Mail boxes for apartment houses with speaking tube compartment, vestibule telephone and push buttons are being manufac-

tured by Cole Metal Products Company, Long Island City, N. Y. A number of different models are described in a new catalog.

Fuse Puller

A combined fuse puller and screw driver is being manufactured by Trico Fuse Manufacturing Company, Milwaukee. The tool is made of horn fibre, 5 in. long. One end has gripping jaws for handling small cartridge fuses ¼ in. to ½ in. in diameter. The other end has a screw driver for use on small screws as found on electric sockets, plugs, radio apparatus. It is insulated and the only metal part, the screw driver blade, extends only ⅜ in. beyond the fibre handle.

Undercutter

Martindale Electric Company, Cleveland, are manufacturing a universal undercutter, motor-driven, for slotting commutators. It can be used on commutators of any diameter and cuts either "V" or "U" slots. The handle may be set at any angle; the motor is mounted on a swivel base or it may be suspended by the handle. The manufacturers state that "with the use of proper brushes, commutator slotting eliminates sparking and commutator wear, increases the life of brushes and decreases heating which permits an increase in the load on a motor or generator."

Portable Hoist Motors

General Electric announces a new line of motors for portable electric hoists which are suitable also for other applications involving intermittent operation and high starting torque. The line includes motors from 1 to 10 h.p. in d.c. types; from 1 to 11 h.p., single speed, 3 and 2 phase, and from 1 to 5 h.p., single phase, in the a.c. types. Three and two-phase, slip-ring type hoist motors are also included from 3 h.p. up. The new motors are totally enclosed and all parts are protected. Bearings are of the waste-packed, sleeve type, being closed against the entrance of dirt from the outside. The d.c. motors are series wound. The polyphase motors have high-resistance rotors, while the single-phase motors have an unusually high starting torque. As a great many of the applications of these motors require a brake the motors are all built to take a brake.

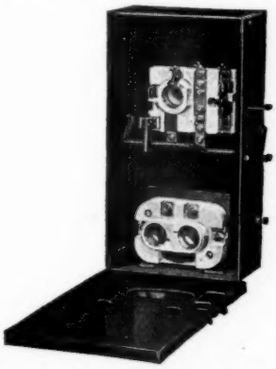
Solderless Connector

Rodale Manufacturing Company, Inc., New York, has placed on the market a solderless connector for connecting two or more wires, which may be used in making connections in

lighting fixtures and in motor leads for motors up to 4 h.p. The wires are held in place by a single screw.

Meter Switches

Killark Electric Manufacturing Company, St. Louis, Mo., will shortly put on the market a line of meter switches of fourteen different types designed to fit directly under the meter, which can be sealed. The main switch can



be thrown in an "off" position and the branch circuit fuses reached by the householder without breaking the seal on the box. The switches take either two or three wire service, with one, two, or four branch circuits.

Propellor Fan

The Sinclair Equipment Corporation, Chicago, has patented and is now manufacturing a new type of propellor fan, the blades of which are so designed that an equal amount of air is fanned along the entire length of blade from hub to tip. It is claimed that this eliminates a center core of motionless air and produces a solid shaft of air instead of a ring. The manufacturer also claims the shape and pitch of the blade reduces air resistance and friction, with the result that the amount of power required is lessened. A fan efficiency increase of 30 percent to 40 percent

is announced by the manufacturer. The driving motor is self-cooling and the fan is so arranged that the stream of air keeps the motor free from dust and dirt.

Circuit Breaker

Martindale Electric Company, Cleveland, are selling an automatic circuit breaker of the armature trip type. It is made in three capacities with the ratings: 5 amp., 10 amp. and 15 amp. The manufacturers recommend that the circuit breaker be used on a.c. circuits only up to 440 volts.

Conduit Fittings

Improvements in its line of rigid conduit fittings are announced by The Adapti Company, Cleveland, as follows: Body sizes have been reduced as far as possible so that now the ½ in. and ¾ in. bodies are made with the same general dimensions and differ only in the size of the hub; and this plan has been followed throughout the whole line. Supporting screw holes for covers are now located in the extreme corners of the fittings to make sure that the screws will not project into the fitting and damage the insulation of the wires. Fittings are now made with a flat bottom with the intention that they will lie snugly against the surface wired over, even in awkward corners.

Cable Ends

New types of "Gee Vee Endo" devices are now on the market, according to the Gillette-Vibber Company, New London, Conn., the

manufacturers. One type is made to clamp on armored cables. It is made in one size that is applicable to armored cables containing two No. 14, two No. 12, three No. 14 and three No. 12 wires. All metal parts are galvanized. It is made with either 2- or 3-hole insulator. Another new type is made with male thread to furnish separately insulated holes for leading in wires to outlet boxes, cabinets, etc., and is now being made for a ½ in. knockout. Insulators are either 2- or 3-hole. Sizes ¾ in. and 1 in., with either 2 or 3 holes, can be furnished on order. Steel parts are galvanized; the nipple is aluminum.

Semi-Threadless Fittings

A fitting for conduit which might be called a "semi-threadless fitting" is being produced by the V. S. Company, New York City. The coupling is threaded half way through to a groove. In making connections the threadless half of the fitting is forced onto the pipe and a reamer inserted to spread the conduit, which holds tightly because of the groove inside the fitting. The other end is threaded and the conduit is screwed in as usual. The inventor claims that the device will hold very solidly and make a compact joint.

Table Outlet

Colt's Patent Fire Arms Manufacturing Company, Hartford, Conn., announces a multiple table convenience outlet known as the "Foursome" because it turns an ordinary outlet into four outlets. The outlet is molded of "Coltrock," a light weight insulating material, and has a cord in the base which plugs into a convenience outlet. The base may also be removed and the top plugged directly into an outlet. The top contains four outlets. The device is 3½ in. in diameter and 1¾ in. high; it is made in black, mahogany, walnut, onyx, green or red.

Cord Grip Sockets

Sockets with armored cord grips are being merchandised under the slogan "The Cord

Can't Pull Out" by Bryant Electric Company, Bridgeport, Conn. The grip is stamped out of $\frac{1}{16}$ in. steel, brass plated, swaged to the top of the cap. The No. AQ cord grip cap for the "New Wrinkle" socket bodies takes cords from ⅜ in. to ½ in. in diameter. No. BQ cap takes cords from ¼ in. to ⅜ in. Circulars on the new grips may be obtained from the manufacturer.

Electric Hammer

The Syntron Company, Pittsburgh, Pa., announces a new type electric hammer for drilling, chipping and channelling in concrete, stone and masonry. The new model weighs less than the old Syntron hammer and has greater power. There is only one moving part—a piston which is drawn back and forth in an enclosed barrel by alternately energized magnets. The hammer operates from any light outlet and a small portable converter is furnished where only direct current is available. The manufacturer states that the new hammer will drill a ⅝-in. hole as fast as twelve men using the old method of star drill and hand hammer; it strikes 3,600 blows on the tool end a minute. The hammer is air cooled and is controlled by a trigger switch in the handle. It weighs 9 lbs.

Water Heater

The Standard Electric Stove Company, Toledo, Ohio, announces that a new electric water heater, of automatic type, is now on sale. This heater is adapted for use with existing tanks, and where it is used in series with another type of heater (such as gas or furnace coil) it can be installed above the other heater on the same pipe and will work when the other heater is out and stop working when the other heater is heating. The Standard heater consists of a water jacket into which the heater tubes are screwed, after being milled for the reception of the core heater. The cores may be removed for servicing without shutting off the water. The pipe connections and wires extend from the case.

Switch Plates

The Crystal Switch Plate Corporation, New York, has brought out a new mirrored glass plate, optically ground and polished to accommodate the Hart & Hegeman single gang combination of tumbler and convenience out-

let No. 8,998. The plate may be had in either gold, silver or radium mirror finish. This unit may be wired so that the current is always "on" in the receptacle part independent of the switch position; or the connections may be so made that the switch controls the receptacle.

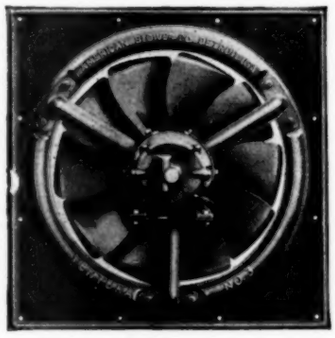
Fixture Canopy Sockets

Fixture canopy sockets, especially designed for kitchen, bedroom, bathroom, store and showroom units, are on sale by the Bryant Electric Company, Bridgeport, Conn. The sockets have a metal shell with screw ring. In mounting the husk engages the chain guide and holds the interior in the socket shell.

The socket ring clamps the socket firmly against the ring in the canopy. There is a notch in the ring attached to the husk that fits into the canopy ring and prevents the socket from rotating.

Fans

The ventilating fan manufactured by the American Blower Company, Detroit, is now furnished in smaller sizes with a square pressed steel plate instead of the circular frame formerly provided and still used on the larger fans. The plate makes it unnecessary to build a frame with a round opening for the fan. The blades are broad and overlapping and are curved similar to those of an aeroplane propellor which, according to the manufacturer, produces efficiency in air stimulation. The blades are riveted to a large



central disc. On the larger sizes a stiffening ring is placed around the edge of the blade for added strength.

Tumbler Switch

The Hart & Hegeman Manufacturing Company, Hartford, Conn., has put on the market a completely enclosed tumbler switch with a composition dustproof base. The exposed metal parts are made of brass and the switch lever may be either brown or black. The line includes single pole, double pole, three-way and four-way switches, and the same assortment with radio luminous jewel.

New Catalogs

Reflector and Illuminating Company, Chicago, Ill., has issued a new 48-page pocket-size catalog of "Sterling Reflectors"—No. 27, dated November, 1927, accompanied by price sheet. In addition to photographs and descriptions of reflectors, the catalog gives information on correct illumination intensities for store windows; how to select the proper reflector; how to install a lighting system in a window.

Arrow Electric Company, Hartford, Conn., has issued a new catalog, No. 23, of wiring devices. There are two pages of switch wiring diagrams.

Martindale Electric Company, Cleveland, Ohio, has issued catalog No. 9, dated September, 1927, on undercutters and slotting equipment. Descriptions, pictures and prices of these tools are given, together with saws and parts.

Partrick & Wilkins Co., Philadelphia, has issued catalog No. 45, dated October 1, 1927, of annunciators, electrical signaling devices and signaling systems. Several installation diagrams are included.

Ilg Electric Ventilating Company, Chicago, has published a circular-catalog showing various styles of "Ilgair" electric ventilators, with prices and photographs of installations.

Major Equipment Company, Chicago, Ill., has issued bulletin No. 10 of borderlights, footlights, covelights and striplights, with much installation information, blue prints and stage lighting data. Details, specifications and prices are included.

Curtis Lighting, Inc., Chicago, Ill., has published an original booklet called "Eye Comfort," which is printed in 11 different languages. It is a simply told story of Rollo and Peter—Rollo made a success by lighting his windows and arranging his store attractively, but Peter failed because of poor lighting and poor display.

Rainbow Light, Inc., New York, has issued a catalog-booklet on Rainbow lights, electric signs using luminous gas tubes. Standard size signs for restaurants, drug stores, etc., are described as well as special signs for special situations.

Misener & Irving Manufacturing Company, Inc., Syracuse, N. Y., has issued a catalog of tools, including a rotary hack saw and a safety conduit seal which are especially developed for electrical contractors.

A new catalog, No. 43, of residential lighting glassware has been published by The Phoenix Glass Company, Monada, Pa. A number of parchment and crackled glass shades are included.

Bull Dog Electric Products Company, Detroit, Mich., has issued catalog No. 27, covering its line of controlling and distributing apparatus for light and power.

News of the Manufacturers

The Abolite Reflector Company is the new name of the AB Products Division of the National Screw and Manufacturing Company, Cleveland, Ohio, according to an announcement dated January 1, 1928. The company manufactures porcelain-enameled steel reflectors and their accessories.

Announcement has been made that Multi-Electrical Manufacturing Company, Chicago, Ill., has taken over the manufacture and marketing of Harter products formerly made by the Harter Manufacturing Company, which is now out of business. The line includes commercial lighting fixtures, ventilated weatherproof nitrolite fixtures, floodlight and spotlight projectors, tunnel headlights, portable lamp stands for garages, fixture accessories, reflectors, positionable sockets, cover sockets and grip-ring bushings.

The American Electric Switch Corporation Minerva, Ohio, announces the addition of several new sales offices: G. P. Atkinson, 19 North Broad St., Atlanta, Ga.; Fred C. R. Spence, 201 Normandy Ave., San Antonio, Tex.; J. L. Barnard, 4033 Colfas Ave., Minneapolis, Minn.; R. W. Mitscher, 395 Ellicott Square, Buffalo, N. Y. New sales offices and warehouses are being opened in Los Angeles and Seattle.

Announcement has been made of the purchase of the Perfection Appliance Company of Detroit by the Splitdorf-Bethlehem Electrical Company, Newark, N. J. Thomas J. Arbron, former president of the Perfection company, joins the Splitdorf organization as executive manager of the subsidiary company.

Lincoln Electric Company, Coit Road and Kirby Avenue, Cleveland, Ohio, announces that it has been granted patents covering welded steel motor frames. The company claims that the welded steel construction gives a practically unbreakable frame, lighter weight and better ventilation.